

JOHN COHEN

HUMANISTIC



On Thinking

"Individuality expresses itself in idiosyncrasies of work habits. We can picture Rousseau working bare-headed in the full blaze of the sun so as to increase the flow of blood to the brain. Bossuet preferred a cold room with his head wrapped up. Schiller sat with his feet immersed in cold water, and his efforts seem to have been invigorated by the smell of decay—fading autumnal leaves, the sepulchral odour of the churchyard or a collection of rotten apples in his desk. Descartes and Leibniz worked in horizontal posture. . . . Balzac, garbed in a monk's cowl, consumed enormous quantities of fresh fruit and struggled right through the night; this continued for long periods while the inspiration lasted. Some prefer to work best at night, others while lying in bed late in the morning. One may be immobile and inert. Another may shut himself in a room and shout and rush about like a madman. . . .

"We have not been concerned in this chapter with the logical, moral or social quality of the final products of thought, in other words, with classifying the ripe apples and pears of the mind. . . . We have been solely interested in tracing particular ideas to their source. As there can be no thoughts without a thinker, thinking means a *person-thinking*. The form of thought, the sort of explanation, suggestion or hypothesis that comes to mind, the amount of effort exerted are characteristic of the thinker as an individual with a distinctive life-history, and every one of his thoughts must be understood in the context of his personal past. To select an isolated thought or action of another person and interpret it in the light of our own values is like choosing an item of period furniture from a friend's house and setting it in the midst of our drawing-room furnished in ultra-modern style. . . ."

—From Chapter 6, "PERSONAL THINKING"

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TO E

*Psychology is the description of the
reflection of the terrestrial world in
the heavenly plane.*

KAFKA

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Preface

PSYCHOLOGY IS THE MOST undisciplined of disciplines, the nursery and romping-ground for every extravaganza, a Tower of Babel for every known and unknown tongue, a mint for counterfeit and spurious coins, a market-place for every pedlar of far-fetched and unlikely theories. It is an amalgam of humbug, platitude, piercing intuition, *naïvité*, soaring flight of the imagination, dull dogma, incisive reasoning and sheer drivel. Hence a certain fastidiousness in deciding what to read and what not to read on the subject is not to be despised. A system for protecting the less wary who venture into the swampy zones of psychological literature may be commended to Psychological Librarians. Every text on the shelves of the psychological library should have inscribed on it the number of grains of salt to be taken when reading it, and on the library table an ample bowl of salt should be placed and replenished at regular intervals. Certain volumes (especially those claiming to reveal the mysterious secrets of personality) should be boldly marked POISON and an antidote or vomitory prescribed to be taken after reading. For the guidance of the reader, I suggest that this book should be read with ten grains of salt, one for each chapter.

Before proceeding further I must ask the reader to undergo an initiation ceremony known among psychologists as an Intelligence Test. In accordance with a tradition made venerable by prolonged if ill-considered usage, he is asked to place a tick (✓) under "Yes," "No" or "Don't know" against each of the questions in the following test:

Yes No Don't know

1. Where wast thou when I laid the foundations of the earth? declare, if thou hast understanding.
2. Who hath laid the measures thereof, if thou knowest? or who hath stretched the line upon it?
3. Who shut up the sea with doors when it broke forth, as if it had issued from out of the womb?
4. Hast thou commanded the morning since thy days; and caused the dayspring to know his place?
5. Hast thou entered into the springs of the sea? or hast thou walked in the search of the depth?
6. Hath the rain a father? or who hath begotten the drops of dew?
7. Out of whose womb came the ice? and the hoary frost of heaven, who hath gendered it?
8. Canst thou bind the sweet influences of Pleiades, or loose the bands of Orion?
9. Gavest thou the goodly wings unto the peacock? or wings and feathers unto the ostrich?
10. Doth the hawk fly by thy wisdom, and stretch her wings towards the south?

Intelligence Tests, I may add, are commonly supposed to have originated with Binet. In fact, they were known in antiquity at least by the author of the book of Job, from where the above items have been borrowed. A reader who is unable to answer all the questions before reading the book is allowed a second attempt after finishing it. If he is still unable to answer these questions, I can only suppose that he should have taken a few more grains of salt.

A word about the plan of this book. I take issue with the view that a knowledge of the brain will eventually tell us all that we need to know about mind. I believe that the qualities of human experience are neither derivable from nor reducible to the activities of the nervous system. Although mind and brain are in the closest liaison, the autonomous principles that govern the mind are different in kind from those that govern the brain. The psychologist will become "scientific" when he recognises that man has a history as well as a nature.

The book opens with a consideration of the many ways in which a system of psychology can be erected and attempts to show how psychological studies can be inspired by judicious analogies from other disciplines as well as be hampered by injudicious ones. The student must begin with reflecting on experience and its meaning from the "inside." This meaning can be deciphered only in terms of the past which has shaped our minds and of the future which we envisage as beckoning us.

Four themes are chosen to illustrate this point of view: first, the successive stages of emotional and social development through which we normally pass from birth to adolescence; second, the personal and social elements in sensory activities, in particular, the pervasive presence of the temporal quality in perceiving and thinking; third, the individuality and social features of thought. The fourth theme embraces three topics of more general interest—work and play, illness, literature.

The book might be equally described as "an elementary psychology for advanced students" or as "an advanced text

for beginners," and I hope that both of these important categories of reader will find time to look at it, if they have nothing better to do, as well as all those who have already begun but are not yet too advanced in their psychological studies.

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PART ONE

Chapter 1

The Difficulty of Making the First Step

THE READER WILL RECALL the fate of the centipede who meditated on the above theme. On being asked by a biped to say which leg he placed down first, the centipede, being a logical positivist, dismissed the question as meaningless. But when night fell it returned to torment him, and, like Jacob and the angel, they grappled together ceaselessly till dawn. By that time he could not walk at all. Profiting from the centipede's experience, the student of the mind may be reluctant to ponder unduly before embarking on his task. If he is a good swimmer, he knows that there are a thousand ways of plunging into the sea, but he would not attempt to determine the merits of each type of plunge before surrendering to the waves. He may recollect the advice given by a famous mathematician to the student who wished to master everything written on a certain topic before deciding which aspect of it to investigate: "Your father would never have married and you would not be with me now, if he had insisted on knowing *all* the girls in the world before marrying one."¹*

All this we grant, but it may still be worth asking oneself,

* References to notes appear at the end of each chapter—Ed.

before entering a jungle, why one path should be chosen rather than another. The vast number of possible embarkation points for the sailor of the mental seas should force this question on him: Is there one ideal port from which to set off? In other words, are there in the study of mind certain inescapable initial assumptions, which are at once necessary and sufficient? How can we unmask our own clandestine preconceptions and the surreptitious ones of other people?

Attempts to make the correct dive into the psychological sea are sometimes criticised on the grounds of limitations imposed on the diver's mind by his country of residence or national character. Seventy years ago Nietzsche posed the question why it is that philosophers born in Britain, from Locke onwards, have searched for a single universal principle of mind "in that precise quarter where the intellectual self-respect of the race would be most reluctant to find it (for example) in the *vis inertiae* of habit, or in forgetfulness, or in a blind and fortuitous mechanism and association of ideas, or in some factor that is purely passive, reflex, molecular or fundamentally stupid."² A few years later, William James, commenting on the "psychophysics" of the German savants, called it a "microscopic" psychology, which could hardly "have arisen in a country whose natives could be *bored*." Were he alive to-day he might be disconcerted by the popularity of "microscopic" psychology in his own country. Some of his successors still feel that there is little point in complaining about British ignorance of scientific psychology, for there is no reason why anyone "with the psychologist's handicap of living in England"³ should know any better. A number of Europeans, for their part, have felt that no psychology could be expected to come from the United States. "Les Américains," said Pierre Janet, "ils ont des édifices magnifiques, des laboratoires impressionnés—mais de psychologie . . .,"⁴ and K. Z. Lorenz⁵ remarked not long ago that an American journal "masquerades" under the title of comparative psychology though to the best of his knowledge no really

comparative paper had ever appeared in it. Henri Piéron has given vent to even stronger feelings. "Il semble," he writes, "que l'on cherche à donner aujourd'hui aux étudiants américains l'impression que l'Amérique seule contribue au développement de la science, attitude symétrique de celle de l'U.R.S.S."⁶

The first step in formulating a theory of mind is peculiarly influenced by the personal characteristics of the theorist as well as by his social heritage. These two kinds of influence are studied by the psychology of thought and the sociology of knowledge respectively, and they reveal the limiting features of the mind which become apparent when it examines its own nature. I do not propose, however, to pursue these types of limitation any further.⁷

Among the profuse flora and fauna of contemporary American psychology it is possible to find every conceivable and inconceivable specimen of psychological first step. Natural selection has led to the survival of only a few of these, especially what has been described as the "muscle-twitch" variety.⁸ This may be contrasted with a recent movement in Germany which challenges both depth psychology and behaviourism. The German movement wishes to create a "height-psychology" which recognises the spirit as the most complete realisation of the human soul. It aspires to explore the free decisions made in scientific enquiry, in everyday conduct and in the creativeness of art. How remote this German trend is from American behaviourism may be gathered from its desire that all its studies should "lead to God as the point of departure and the target of all human activity, and thereby become incorporated into a psychology of religion."⁹

Assumptions, it may be noted, are sometimes displayed with embarrassing candour, as in the following statement: "I in my future work intend to go ahead imagining how, if I were a rat, I would behave as a result of such and such a demand combined with such and such an appetite, and such and such a degree of differentiation and so on." That is to

say, the theorist proposes first to imagine how he would behave if he were a rat, then to interpret a rat's behaviour on this basis, and finally to argue from this to the way people like himself actually behave.

Such theorists are convinced that they have placed all their cards on the table, innocently unaware that their sleeves are bulging with cards on which they unwittingly rely to play the game. The elaborate system of the late Professor Clark Hull of Yale seems to exemplify such a state of affairs. It is true that he has tried to erect an Empire State Building, but it has turned out to be based on shifting sands. He takes it as self-evident that all human conduct is due to a hierarchy of habits acquired through the pleasures of "drive-reduction." The result is that our thoughts and feelings, our dreams, purposes and all the other creatures of the mind are laid eternally to rest in the sepulchre of the nervous system.¹⁰

The problem of the first step confronts us in the analysis of particular concepts as well as in entire systems. Take the idea of modesty. Diderot described modesty as a "social chimera" because it disappeared during illness and misery, to which Balzac retorted that one might as well say that life itself is a chimera because it disappears at death. Unlike Diderot, Rousseau, his contemporary, insisted that modesty is real and originates in the arts employed by the female to attract the male. To this view Balzac, foreshadowing Freud, also objected. Rousseau, he declared, had committed the error of his age by explaining modesty "in the light of the relation of man to his fellows, instead of in the light of the moral relations a man has with himself."

The difficulty of finding a jumping-off ground in the study of personality has led to a curious array of dismal, dilapidated and decrepit doctrines, most of which are already derelict. Two of the brighter ones may be identified quite simply by the presence or absence of a hyphen in the expression "interpersonal." We can write either "inter-personal" or "interpersonal." In the hyphenated variety of inter-personalism each

person is conceived as a self-contained entity governed by "laws" of individual behaviour and linked to others by circumstance. This is merely the individualism of John Stuart Mill, who wrote that "human beings in society have no properties but those which are derived from and may be resolved into the laws of individual man,"¹¹ a dogma which provided the corner stone for a psychology of the self-made man. The hyphenless variety of interpersonalism assumes, on the contrary, that the concept of a separate person is a metaphysical one and that we can have no empirical knowledge of such a creature. We know only of *relationships* between persons: we must therefore begin with "interpersons," not with persons.

A third approach takes it for granted that no psychological assumptions whatsoever are necessary in the study of personality, a calculating machine being all that is needed. The outcome is a bloodless distortion of *homo sapiens*.

Let us now turn to points of departure in psychological theory which can be identified with historical antecedents. The origin of many ideas in psychology can be traced to analogies with ideas which were or are current in other disciplines. Physics, chemistry, geology, mathematics, embryology and epidemiology, have each proved a source of stimulation. Even economics has had its uses in this respect. The history of psychology may indeed be regarded as a sequence of conceptions based on such analogies. There are certain hazards in this practice. A time lag usually elapses before an idea which seems to hold good in one sphere has an impact on another, and by that time it may have been abandoned at its source. The mechanistic model of mind fashionable in the nineteenth century is a case in point. As Eddington declared, we cannot introduce a determinism into the study of mind in the belief that we are thereby making it conform with experimental knowledge of natural laws; if determinism is to be accepted in psychology, it must be based on a study of the mind itself.

There are other dangers as well. The history of thought provides, in Descartes, a thinker who recognised the decisive importance of the correct first step to be taken before undertaking the task of constructing a system of knowledge. The efforts of a contemporary psychologist who endeavoured to follow the Cartesian path were not crowned with success; he refused to distinguish between *cogito ergo sum* and *credo quia absurdum*, and wrote *cogito ergo absurdum*!; shortly afterwards he published a treatise in which factor-analysis is applied to the study of personality.

Among the first to think of mental events as subject to laws similar to those that govern material events was Thomas Hobbes (1588–1679). In his *De Cive*, published in 1642, the year of Newton's birth, he wrote that "everyone is compelled to seek what is good for him, and avoid what is bad for him by a necessity not less than that which compels the stone to fall downwards." This Newtonian figure of speech was the forerunner of many other analogies in psychology inspired by physical science. One of these gave rise to the principle of associationism which from the outset appears to have been conceived as the mental counterpart of gravitation.

The conception of a mechanics, statics and dynamics of the mind was introduced into psychology by J. F. Herbart (1776–1841). Ideas, he believed, can move between a state of complete freedom at one end to a state of complete inhibition at the other, and they constantly strive towards freedom. Just as gravitation is the fundamental principle of physical mechanics, so the "motion" of ideas is the basic principle of mental mechanics. With a similar end in view, W. Ostwald (1859–1932) attempted to extend the notion of energetics to the scientific study of human happiness.

The idea of a *mental chemistry* captivated John Stuart Mill (1806–1873), and he substituted it for the mental mechanics favoured by his father, James Mill. Ideas, he held, coalesce in a way which resembles chemical fusion. In so

doing they yield something new, just as hydrogen combines with oxygen to give water; and just as the prismatic colours when shown in rapid succession "generate" white without themselves being white, so simple ideas, by blending, generate more complex ones. Mental chemistry reminds us of the metallurgical psychology of the mediaeval and later alchemists for whom metals and their properties possessed a symbolic spiritual significance. Thus John Pordage in his *Sophia* (1699) wrote:

"Accordingly and so that I should arrive at a fundamental and complete cleansing from all tares and earthiness . . . I gave over my will entirely to its [wisdom's] fiery smelting furnace as to a fire of purification, till all my vain and chaff-like desires and the tares of earthly lust had been burnt away as by fire, and all my iron, tin and dross had been entirely melted in this furnace, so that I appeared in spirit as a pure gold, and could see a new heaven and a new earth created and formed within me."¹²

This metallurgy of mind itself derives from the older astrological psychology which may be traced to ancient Babylon and which linked the seven planets with the seven metals—Saturn with lead, Jupiter with tin, Mars with iron, Sun with gold, Venus with copper, Mercury with quicksilver and Moon with silver.

A *geological* analogy with mental life is exemplified in the theory of stratification in child development. This theory supposed that the mind consists of lower strata for the nutritive, sensory, motor processes and of higher strata for such functions as memory and reasoning, successive layers being formed as the child grows older. Sir Francis Galton's conception of mental testing as the sinking of shafts in the mind at various critical points is similarly inspired by a geological technique.¹³ Geological analogies with mind are also employed by Freud, and more recently the personality has been

explicitly described as "built up of layers which can be compared with geological layers."¹⁴ The analogy must have appealed to Proust, for he employs it in his *Remembrance of Things Past*.¹⁵

"Man is not a geometrical proposition." With this sceptical statement Pascal rejected the notion of a *mathematical* psychology. He must have had a premonition of the psychological atrocities that would one day be perpetrated in the name of "exact science." Spinoza took another view, for he wrote in 1677 that human desires and actions are no less subject to law than planes and bodies are governed by geometrical principles. A systematic effort to establish a mathematical psychology was not, however, made until more than a century later, in the work of Herbart. The attempt failed completely because Herbart believed that he could dispense with empirical content for his formulae. For example, he represented the mental force directed to a particular idea at any particular moment by the equation ¹⁶ $z = \phi (1 - e^{-Bt})$; where z is the force of attention at time t , ϕ the entire mental force, B the perceptual intensity, and t the time elapsed since first considering the idea; but how such symbols and relationships could be given a concrete meaning was left unexplained.

About the middle of the nineteenth century the imagination of many persons was fired with the idea of quantifying realms of mind previously thought to be resistant to such processing. The most spectacular attempt was made by Mr. Tresham Gregg, Chaplain of St. Mary's within the Church of St. Nicholas intra Muros, Dublin. Mr. Gregg was eager to discover the "arithmetic of heaven," and his discourse, which appeared in 1859, undertook to apply algebra and the calculus to metaphysical, moral, social and political problems, and even to ecclesiastical affairs. He translated the eighteenth Psalm into the language of the calculus, and demonstrated that

the increase of David's educational excellence or quali-

ties—his piety, his prayerfulness, his humility, obedience etc.,—was so great that when multiplied by his original talent and position, it produced a product so great as to be equal in its amount to royalty, honour, wealth, and power etc.: in short, to all the attributes of majesty.

This exploit was followed by a solution of what Mr. Gregg called the "family problem." He determined the effect on various members of the family of a change in the conduct of any one of them, e.g. a maid servant. De Morgan has given us Mr. Gregg's formula for the father in the role of the girl's employer, but he refused to reveal the formula for the son's relation to the maid because he was not quite sure "that all young masters are to be trusted with it."

Mr. Gregg has been outdone by present-day zealots anxious to achieve even greater feats in the "measurement" of personality. A century ago Boole warned against the error of borrowing a mathematical notation and then assuming that in its new application the laws by which its use was governed would remain unchanged. In the misguided attempts to subdue the personality with statistical weapons, this warning has been largely ignored.

Among the newer "analogical" approaches to psychology, there are two outstanding ones. Piaget's imposing theory of intellectual growth might be described as an *embryological* psychology, for it traces the appearance, development and maturation of mental structures in the way the embryologist describes the development of bodily structures. Piaget began his career in zoology. In his autobiography he tells us that the mental habits he acquired in that discipline served him well when he turned to the mind, where he has discovered "a sort of embryology of intelligence."

In the analogies from *epidemiology* which Prof. Lionel Penrose has introduced into psychology we also have a novel conception of considerable interest based on a resemblance between the transmission of physical infection, on the one hand, and the transmission of ideas, on the other. Corre-

sponding to the three principal factors in physical epidemiology—the infective agent, the means of transmission, and the susceptibility of the exposed population, there are, in mental epidemiology, (i) the quality of the idea, (ii) the various media of communication and (iii) the state of mind of the recipient. Such mental epidemics may appear in the form of a craze, fashion, panic, a religious revival, war-fever, a dancing mania or the growth of a learned society.¹⁷

An *economics* of the mind is exemplified in the Freudian representation of consciousness as controlled by the production, distribution and consumption of definite quantities of physical energy, this control following the economic principle of seeking the greatest advantage for the least effort. This point of view has turned out to have great heuristic value in helping us to explain and understand a variety of mental phenomena.

Finally there is *neuro-physiology* which has come to be regarded as the perfect source of analogies with mind. On this view, all forms of subjective experience—consciousness, will, feeling, emotion, desire, thought—are mere epiphenomena, and if they are to be studied “scientifically” they must be “reduced” without remainder to neuro-physiology. It is not the neurologists who deny that the psychological world can be studied in its own right and in its own language. The culprits are those who profess to be “psychologists,” aided and abetted by philosophers whom Sir Russell Brain has described as making “their living by expounding the non-existence of their own minds.”¹⁸

It is instructive to discover that Freud himself at first inclined towards biochemical and neuro-physiological reductionism, but later he abandoned hope of ever achieving it and developed his system of pure psychology. He and Aristotle, worlds apart as they are in other respects, shared one significant belief—that the study of the mind must be entirely detached from the anatomical study of the brain.¹⁹ Their insight into human life was in no way dimmed on this account.

In its most general form, reductionism entered psychology with the concept of equilibrium, first suggested by Claude Bernard.²⁰ He never intended it to have more than a strictly physiological meaning, in the sense of the body's tendency to preserve steady states. Fechner gave it psychological content in his "principle of constancy." Delboeuf's "law of tension" which stated that a disequilibrium follows any change in the optimal level of stimuli to which the organism is adapted, and Wundt's theory of a continuum of tension-relaxation as a dimension of feeling are minor variations on the same theme. Freud, influenced by Fechner, placed the idea of equilibrium at the basis of his own system. The idea occurred to him at least as early as 1892 when he spoke of a person's need to preserve a level of excitation or tension characteristic for him, his aim being to preserve this level rather than to abolish it altogether. In his *Project*, written in 1895, the idea of constancy appeared as a "principle of inertia." The "pleasure principle" which he later preferred was only another formula for the same thought. W. B. Cannon,²¹ who coined the word "homeostasis" to express the tendency to maintain steady physiological states, succumbed to the temptation to extend it to the realm of sociology.

Now, whatever the value of the principle of equilibrium in physiology where it arose, whether it is called constancy, stability, homeostasis or negative feedback, its explanatory value in the domain of mind is limited. It cannot provide a complete explanation either of individual or of social behaviour. It serves to express the important elements of stability and resistance to change, but it does nothing to convey the part played by instability and the impulse to change in human life. These are just as fundamental, and without them social change would be inconceivable. The behaviour of man is unintelligible without recognition of a principle which is the very antithesis of constancy. The restlessness of individuals and groups, the love of novelty, exploration and adventure, innovation and the phenomena of conversion all bear witness to a positive instability in life, to movement

away from an equilibrium. In some respects we like to remain as we are and in other respects we like to behave differently and become something other than what we are. No principle of constancy can explain the passion for world conquest displayed by a Napoleon or Hitler, the conversion of St. Francis or Tolstoy, the sudden change of a regime from a feudal to a socialist economy, the wanderings of the great explorers, the bank-clerk's desire to change his job or the reductionist's impelling urge to explain our behaviour in a way which he thinks is new. Constancy and inconstancy are the two poles of human life.

What does the spokesman for reductionism have to say? To begin with, he tells us we are still allowed to use the word "mind" as a rough label for the brain, but we may no longer use it to denote a separate entity. Thus all the problems of direct experience can be quietly ignored. Nothing more is needed than to find out what happens neurologically between the presentation of a stimulus and the response made to it. There is no point in troubling about what either of them *means* to the person concerned. He is treated as if he were a photo-electric cell. No direct study can be made of the cell itself. Just as we can only observe the intensity of light falling on the cell and the intensity of the electric current flowing from it, so, it is said, the psychical can only be inferred indirectly from the physical.²²

The High Priest of "reductionism" is Rudolf Carnap. One's first impression from his recent writings²³ is that he has retreated from his rigid position of earlier days in the interpretation of psychological phenomena. For he now concedes, what others have never found it necessary to doubt, that the total rejection of introspection by the behaviourists was quite unnecessary and that a person's awareness of his states of imagining, feeling, etc., must be recognised as a kind of observation not different in principle from *external* observation. Introspection is therefore a legitimate source of knowledge though limited by its subjective character. He also now concedes that the narrowness of behaviourist theory is partly

due to the influence of the immaculate empiricism that he and his followers had previously flaunted as the Banner of Truth, but which they do not now wish to identify themselves with. It soon becomes evident, however, that these concessions are without substance. The retreat is a tactical one only. Carnap still believes as devotedly as ever in the ultimate reduction of psychology through micro-physiology (i.e. interpretations in terms of cells, molecules, atoms, fields) to micro-physics. It is the old and obsolete physicalism repolished to look like new.

The reductionist point of view imposes severe limits on psychological enquiry, if it does not dispense with it altogether. It implies that we can establish a one to one correspondence between qualities of experience and physical characteristics of the stimulus. The "inside" of experience is taken to be derivable from the physical dimensions of the stimulus. But knowledge obtained from the study of the outer behaviour of man can never take the place of knowledge obtained from the "inside," from inner experience. A piece of chalk, if snapped in two, appears the same inside and outside. Man would also be the same inside and outside if by "inside" we meant a cross-section of his body. Our difficulty in coping with the "inside" may be due to the fact that we have been formed, during the course of evolution, in a struggle with the external world. So it is easy for us to discern things outside us. When we look within, our vision is clouded and we grow dizzy.²⁴

The psychologist's task is not to cut his own throat by writing himself off. It is to elucidate just those aspects of life which have no place in the world picture drawn by the physical scientist, to begin, in fact, where he leaves off.²⁵ If the psychologist were only allowed to make statements which could be translated into the language of neuro-physiology, he would have nothing to say. How can meaning or value or aesthetic experience be translated into such language? It would be just as preposterous to ask that the neuro-physiologist should be allowed only to make statements translatable

into mentalistic language. The reductionist imagines that he is being really "scientific" by never stating any problem in psychological terms. He is strengthened in this faith by those who believe that it is possible for electronic "organisms" to simulate all that the mind or brain can do. This is not a new idea. In 1747 La Mettrie²⁶ published *L'Homme-Machine* in which he eliminated all non-mechanical elements from the universe and thus transformed the dualism of Descartes into a wholly mechanical monism which governed human beings and animals alike. Seventy years later, Babbage constructed his famous Analytical Engine, ancestor of a large brood of mechanical "organisms" hatched during the last decade or two. The extraordinary exploits of such ingenious creatures as Dr. Ross Ashby's *Homeostat* and Dr. Grey Walter's *m. Speculatrix* make us wonder whether electronic devices can really embody the essential features of the human mind. If so, a *Homeostat* of the future may produce for us a second Dr. Ashby identical in every respect with his forerunner except that the first produced but was not himself produced by a homeostat.

Those who demand a neuro-physiological language may nevertheless admit with a certain pathos that the nature of our subjective awareness of life perplexes them sorely. But by turning a blind eye to it they hope to solve such awkward problems as the problem of pain. "Subjective language," we are told, "is defeatist," because if we describe our pain in such terms we imply that it is our own and that we intend to keep it since no one can put an end to it, whereas if we describe our pain in objective language we are immediately faced with a great prospect of relief. If we talk about pain "by comparison with machines and other objects, in terms of nerves and their impulses, and above all in terms of brains . . . then at least we may be able to teach ourselves not to feel pain . . ." ²⁷ How, one feels constrained to ask, could such optimism itself be described in "objective" language? Actually, the irreducibility of mind to brain is beautifully ex-

emphified in the experience of pain, for without *awareness* there can be no pain.

Indeed the more forthright advocates of reductionism give themselves away when they let their hair down and begin to talk of something close to their hearts. "All psychological explanation," writes Prof. C. C. Pratt, must "move in the direction of physiology,"²⁸ because scientific observation is exclusively concerned with the palpable world. The immediate determinants of thought and behaviour must therefore be placed "within a definite region accessible to human observation and verification." But the one who makes this assertion is a gifted musicologist and when elsewhere describing the "tertiary qualities" of music he writes: "The sadness of music is not the sadness produced by a particular event, but universal sadness, without accessories or motives or consequences."²⁹ His description of the sadness of music is none the worse for being neither palpable nor moving in the direction of physiology.

Reductionists accept the working hypothesis that the brain acts as a machine. But they are not quite sure about this. Whether or not the brain is only a machine is a question which some of them regard as too complex to be discussed.³⁰ There is apparently some uncertainty in their minds as to whether the brain is or is not *only* a machine. We are left to puzzle out how it is possible for a mind which reflects a machine-like brain to entertain the possibility that that which it reflects may not be entirely a machine.

To sum up: the subject-matter of psychology is distinctively human; it is not the mere "lining of physiology." Our first step should therefore be to study what is characteristic of man, the blossom rather than the root.³¹ Our starting-point must be the phenomena of experience from the "inside." At the next stage, connections with the "outside" can be established, thereby linking psychology with the other sciences.

No better example of a characteristically human experience

can be found than "blushing," which Darwin³² singled out as the most peculiar and the most human of all forms of expressive behaviour. Blushing cannot be caused by any action on the body. The mind must be affected. Even Dr. Ashby's *Homeostat* has not yet blushed, and is unlikely to do so unless at the thought of how far it falls short of its master's aspirations. "Thinking what others think of us excites our blushes," wrote Darwin. Blushing is possible because attention—"perhaps the most wondrous of all the wondrous powers of the mind"—can influence the capillary circulation. This is only one of innumerable examples which show that no understanding of experience is possible if we assume that consciousness and attention are nothing but occult qualities gratuitously introduced into the palpable world of anatomical "reality."

Perhaps the best reply to the neuro-physiological reductionist would be given by the great Maréchal de Turenne, whom Napoleon held in such high esteem. The Maréchal used to say to himself before entering battle: "You tremble, carcass, but you would tremble still more if you knew where I am going to take you."

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3. E. G. Boring, *American Journal of Psychology*, 1936, 48, p. 696.
4. Quoted by A. A. Roback, *Three Hundred Years of American Psychology*, New York: Library Publishers, 1952.
5. K. Z. Lorenz, "The Comparative Method in Studying Innate Behaviour Patterns," *Physiological Mechanisms in Animal Behaviour*, IV, London: Cambridge University Press, 1950, p. 240.
6. Henri Piéron, *L'Année Psychologique*, 1954, 54 (1), p. 287. This statement occurs in a review by Piéron of an American book

entitled *The Human Senses* by F. Geldard. This is a subject to which Piéron, in a lifetime devoted to it, has contributed more than perhaps any other living person, yet the name of Piéron does not appear in the book. No wonder Piéron writes: "Geldard paraît avoir évité systématiquement toute citation d'auteurs de langue française, même sur des questions où, dans ses travaux personnels, il avait été appelé à en prendre connaissance (sur le sens vibratoire ou le flicker), et même d'auteurs européens en général."

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16. The reader will note a resemblance between this equation and Hull's formula for habit strength:

$sH_R = M (1 - e^{-iN})$; where sH_R is habit strength, M the physiological maximum of habit strength, e is 10 and i a constant.

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20. C. Bernard, *Leçons sur les propriétés physiologiques et les alterations pathologiques des liquides de l'organisme*, Paris: J. B. Ballière et fils, 1859.
21. W. B. Cannon, *The Wisdom of the Body*, New York: Norton, 1932; *The Way of an Investigator*, New York: Norton, 1945.
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23. In *Minnesota Studies on the Philosophy of Science*, H. Feigl and M. Scriven (eds.), Minneapolis: University of Minnesota Press, 1956.
24. J. Ortega y Gasset, *The Modern Theme*, London: Daniel, 1931, p. 25.
25. F. A. Hayek (*The Sensory Order*, London: Routledge & Kegan Paul, 1952) makes out a strong case for this point of view.
26. La Mettrie was anticipated by Raymond Lully, a thirteenth-century alchemist, who described, in his *Ars Magna*, a "philosophical abacus" which could answer the questions put to it. The "machine" consisted of a series of concentric circles, and arranged on them in a given sequence were words which represented various principles. By placing certain words in a given interrogatory order, other words yielded the answer. During the sixteenth and seventeenth centuries, the belief that it was possible to construct a human automaton or *Golem* was widely held in theosophist and cabalistic circles, and legend credits the Rabbi Loewe of Prague with having created such a monster.
27. J. Z. Young, *Doubt and Certainty in Science*, London: Oxford University Press, 1951.
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29. C. C. Pratt, "Music as the Language of Emotion," *Library of Congress*, Washington, D.C., 1952, p. 21.
30. W. R. Ashby, "The Cerebral Mechanisms of Intelligent Action," in D. Richter (ed.), *Perspectives in Neuropsychiatry*, London: H. K. Lewis, 1950, pp. 79-94. I find myself in closer sympathy with a recent statement by Dr. Grey Walter to the effect that electronic computers and other devices described as

models of human behaviour bear "no more relation to the human brain than a hacksaw does to the human hand." So imaginative and gifted a scientist could hardly come to any other conclusion. *Discussions on Child Development*, II, J. M. Tanner and B. Inhelder (editors), London: Tavistock Publications, 1956.

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PART TWO

Chapter 2

The Shaping of the Young Mind

ANY ATTEMPT to give a coherent account of the development of thought and behaviour in childhood must be a construction if not a fabrication. The young infant cannot tell us what is going on in his mind. Nor is the older child very articulate. So we have to make a meaningful whole from the available fragments. The method of study is like that of the anatomist who has to reconstruct the entire skeleton of a prehistoric man when all that survives is a piece of jaw-bone, or like that of a classical scholar who has to erect an entire metaphysical system out of one or two broken sentences left by some Zeno or Parmenides as his sole legacy to posterity.¹

Such a construction cannot be rejected out of hand on the ground that it is not the only one which might be made. Even physics cannot do without constructions which are not uniquely determined by the data. Whatever misgivings the reader may therefore have about the interpretations to be given of child behaviour, he need have none on the ground that alternative ones are possible. Psychology, Queen of the Inexact Sciences, arouses enough intellectual anxiety as it is. There is no need to invent additional cause for misgivings.

We owe to Greek thinkers two kinds of explanation of the way organisms develop.² Hippocrates held that the entire adult animal is present in miniature form in the sperm, the animal merely growing larger until it reaches maturity. Indeed, before the invention of the microscope medical artists used to draw a tiny mannikin curled up in the sperm. This idea is known as *preformation* or *pre-existence*, and it appears to have been taken for granted in mediaeval Islam. The early commentators on the *Koran*³ tell us that

"God stroked Adam's back, and extracted from his loins his whole posterity, which should come into the world until the resurrection, one generation after another; that these men were actually assembled all together in the shape of small ants, which were endowed with understanding; and that after they had, in the presence of the angels, confessed their dependence on God, they were again caused to return into the loins of their great ancestor."

In modern guise, pre-formation was presented by Weismann as a scientific theory in 1892.

The other explanation—known as epigenesis—is that the organism starts life as an apparently amorphous being and acquires its adult shape through the action of formative agencies within it, a view first advanced by Aristotle. It is supported by the fact that the microscope discloses few structures in either ovum or sperm. Experimental evidence can also be cited in its favour. For example, if half an embryonic newt or sea-urchin is destroyed, a complete organism can develop out of the other half of the embryo. This shows that there are latent powers in the embryonic cells the existence of which would not be suspected from what takes place in normal growth. The organism has a storehouse of potentialities which, in propitious circumstances, gradually unfold themselves. Now, in modern biology some synthesis of pre-formation and epigenesis is taken to be necessary if all the facts are to be understood. A combination of these two

contrasting views is also essential in the study of the mental life of the child, as we shall see.

Let us begin by considering the principal difference between a young child and a young animal. A child does not begin as an animal and then gradually acquire the features of *homo sapiens*. The child is a human being right from the very start, and he has relatively little in the way of inborn instructions (or instincts) telling him beforehand *what*, *when* and *how* to do that which he is spontaneously going to do in the course of his life. He has few of those built-in devices or "innate releasing mechanisms"⁴ which regulate an animal's existence. All the equipment that he has of this kind serve the activities of his "vegetable soul"—breathing, sucking, digesting, excreting, but even these become delicately responsive to his activities as a "non-vegetable." Everything else he has to *learn*. And he has a relatively longer childhood than any other creature in which to learn. This relative duration of the period of development is the most striking biological feature of man as compared with animals.

In place of mechanisms built-in from the outset of his existence, the child has to acquire them in the course of his experience by learning. The instructions which he needs in order to learn must be given at the correct phases of his development, for in the sequence of growth there are optimal times of receptivity to particular influences and of responding to them. At each phase, too, there are characteristic hazards. If, for example, the infant fails to learn to walk or talk when he is physically and mentally ready, he will find it harder to do so afterwards. He may acquire other habits instead which will be difficult to unlearn. Once the child has come to terms with his surroundings without a given skill, the attempt to acquire this skill later on may be a disrupting experience. But mistakes once made are by no means ineradicable, though they may become increasingly harder to root out as the child grows older. It is during the transition from one phase of development to another that the possibilities of correcting earlier errors become specially favourable.

In this respect there is a similarity between the human infant and the infant animal. During the course of an animal's development, too, there are times when it is more receptive to influence and more vulnerable to interference with normal habits. *When* a particular experience occurs, its timing in the sequence of growth is the decisive factor. The importance of timing has been demonstrated by experimentally modifying the early environments of various species of birds, sheep, guinea-pigs and puppies, and observing them later when they have reached the adult stage. A lamb raised in isolation on the bottle does not join the flock when brought back. She wanders off, and when, in due course, she produces her own lamb, her reaction to it is one of indifference in contrast to the persistent vigilance of normal sheep.⁵ The timing of experiences is fundamental for intellectual growth as well as the development of the emotions and social sensibilities. To this point we shall return later.

During growth, inherited dispositions unfold themselves. Other features are added during the period of pregnancy, and from birth onwards countless new characteristics are acquired and existing ones accentuated. Development from infancy to adolescence is particularly marked by a growing capacity for discrimination. This capacity is apparent even before birth. A foetus two or three months old removed by Caesarean operation to save the mother's life makes massive responses to light pressure, many groups of muscles being affected; if it is a month or two older, it responds to the same stimulation in a more restricted way; for example, it makes sucking movements when patted on the cheek. The new-born infant's general excitability assumes more and more specific forms as the weeks pass by. Diffuse activity is replaced by limited and localised responses.⁶

Because of the enhanced powers of discrimination which come with increasing age, a characteristic difference between a child and an adult lies in the degree to which they behave respectively in an "all-or-none" fashion. An infant invests his

entire being in everything he does. He is single-minded and whole-hearted in his concern for the here and now. If he is hungry, his irritability overflows its banks and inundates his entire behaviour. His hungry father, on the other hand, may be able to limit the disturbing effect of hunger to an appropriate remark about causes and effects of delay in serving the meals; a greater capacity for differentiated behaviour means that one can act "in part." The father presumably knows more, his feelings are more variegated, and his skills are more diverse; so it is easier for him to react in part. He has a greater number of "parts." All learning, indeed, as K. Lewin has suggested, is, in a sense, a progressive discovery of structure in the material to be learnt, or in the spheres of experience which previously seemed to be structureless. To learn a foreign language means to have the structure of its syntax clarified. To learn how to get from one place to another means to perceive the structure of the route. To learn how to achieve a social goal means to grasp the pattern of personal relationships between the individuals involved.

The young infant is very labile in his moods, attachments and intentions, passing quickly and easily from one transient state of mind to another. The boundaries between his moods or activities become increasingly harder to cross as he grows older, and inner tension is less apt to spread from one "zone" to another. With increasing age resistance to "invasion" of the personality also lessens. When a young child is playing with his toy, he is so much attached to it that it almost becomes a part of his own body, and he strenuously resists interference. The younger the child the more disproportionate the effort he exerts in doing any task. In lifting up a cup, he grabs it with both hands and holds it as tightly as he can. Among normal adults such behaviour is rare. In relationship with others, the tendency of the growing child is towards increasing independence. Perhaps the most marked trend is revealed in the extension of his temporal horizon so that it becomes possible for him to shift from immediate goals

towards more distant ones. The baby lives entirely in the present, unable to look into the past or future. Slowly consciousness begins to extend backward and forward in time.

I return now to the need for the correct *timing* of experiences in intellectual development. The overriding importance of recognising the precise stage of intellectual growth reached by the child is brought home to us when we consider the question *when* he should be taught *what*. A teacher usually explains an idea to a child as he (the teacher) understands it, although the idea may have had a long and intricate history and its present form may be far too sophisticated for the child's comprehension. This is exemplified, as Mary Boole⁷ has pointed out, in the teaching of the elementary concepts of mathematics. There is a vast difference between a particular mathematical idea and a formula which embodies it in a concise and economic form. The formula may contain in itself the cumulative efforts of generations of mathematicians. It is like a tool refined by countless successive hands. We teach children how to use the tools of thought without enabling them to understand the various stages which preceded their present form. There is a correct age for teaching mathematical ideas from the simplest to the most advanced. The actual historical order in which they were developed is not necessarily the best for teaching purposes. Thus Piaget has shown that the child's geometrical notions develop in an order which is the reverse of the actual historical order of their development. What the child needs above all in learning elementary mathematics or science is *repeated* experience of the idea or phenomenon to be taught.

Methods employed for enriching the child's mind with mathematical or scientific concepts should be divorced from any suggestion that they are being taught these things for their own good. When a child comes to learn a particular algebraic technique, he should already have within him a long series of experiences of handling the problem involved. Children aged five or six years can already be taught to draw a series of ellipses with a piece of string, a pencil, and two

nails stuck in a cardboard. By manipulating these things, they can acquire the experience of drawing ellipses with different ratios of major to minor axis and in this way can soon grasp the relationships between an ellipse, a circle and a straight line.

The child is ready to learn to use digit places on paper when he is perfectly used to making a coloured counter stand for ten black ones. He is ready to begin algebra when he has played many games of guessing the number a given bead or counter stands for. He is ready for geometry when he has had ample experience of drawing, for his own pleasure, all manner of shapes, circles, squares, triangles, etc. Once a body of experience is established, the actual teaching of the technical features becomes a relatively easy matter.

At this point we might ask ourselves whether any ideas are given us independently of experience, whether, that is to say, we have some "pre-knowledge," or disposition to form certain ideas which are merely verified, not generated, by experience. With the exception of C. G. Jung, modern psychologists reject outright the suggestion that there are or can be innate ideas in any sense whatsoever. Such a suggestion is heresy of the most disreputable kind. We have a right to ask, however, whether there may not be some element of truth in this heresy. At least we can attach some weight to the part played by intuition in the development of scientific ideas. There are among contemporary physicists those who believe that this intuition transcends experience, that, for instance, we are endowed with a natural tendency, not due simply to contact with certain ideas, to interpret our sense perceptions in terms of Euclidean geometry. W. Pauli⁸ writes that for Kepler, "the symbolical picture precedes the conscious formulation of a natural law. The symbolical images and archetypal conceptions are what cause him to seek natural laws." Kepler certainly believed that mathematical reasoning is "in-born in the human soul." The problem of the psychological origin of our ideas about the universe must be reopened afresh and reconsidered in the light of the natural history of the mind in childhood, on the one hand, and of the development

of scientific concepts on the other. Conceivably, the assumption that the mind at birth is nothing more than a *tabula rasa* may yet turn out to be ill-founded and an over-simplification of the facts, and that there is some "correspondence" between the cosmic order and "images" which pre-exist in the psyche.

I now propose to give a brief sketch of emotional development from birth to puberty.⁹ Four stages may be conveniently distinguished: infancy, childhood, the juvenile period, and pre-adolescence. These stages are initiated by needs that unfold as the child matures. Every normal child should pass through them in their proper sequence, and each stage must be more or less successfully completed before the child is ripe for the next. If the needs that emerge during one phase are not satisfied, the advent of the next stage will be delayed, though it is to some extent possible to correct errors due to unfortunate experiences at an earlier stage. Naturally the more errors that accumulate, the more difficult the correction.

We are here chiefly concerned with emotional and social aspects of development. These are not independent of intellectual growth. In fact the intellectual, emotional and social features are so closely interwoven that it is only for convenience of presentation that they have to be discussed separately. The nature of intellectual growth from birth to adolescence is a vast and intricate subject to which here I can only make the barest reference.

The problem of identifying distinct stages in development is an exceedingly difficult and delicate one. Many attempts have been made, but the criteria which they employ to demarcate the alleged stages are usually arbitrary. The advantage of the scheme described here is that each stage is initiated by the unfolding or appearance of new needs or capacities which promise to transform the life of the child. Apart from the psychoanalytic system of stages, two other very notable systems should be mentioned, those of Piaget and Wallon respectively. Piaget's system refers almost entirely to intellectual aspects of development, whilst Wallon's deals

with emotional development and emphasises the role of emotion as a positive rather than as a disturbing force in mental growth.

Piaget's stages are identified by two principal criteria: first by the formation of new features, and second, by their final form or equilibrium, which initiates a new stage. Every stage is at the same time a level of achievement in relation to the past and a preparatory phase in relation to what is to come. The stages distinguished by Piaget are characterised by a structured whole or ensemble of mental features not by isolated fragments of behaviour. In passing from one stage to the next, the earlier is integrated into the later stage and thereby becomes part of it, and the order of succession of stages is constant. Thus, for instance, the "idea" of the permanence of objects, acquired at the sensorimotor level, is one of the elements in the broader notion of conservation which develops at the next stage.

Whilst Piaget is principally occupied with the intellectual changes that take place at different ages and stages and more especially with the nature of the *final* mental structures, Wallon is essentially concerned with the *origins* of thought and character, and he is at pains to analyse the interaction between the numerous factors of all kinds which arise during the different stages or the transitions between them.¹⁰

Infancy extends from birth to the time when the infant stammers out his first sentences. From the very start he imbibes the influence of his social *milieu*. This takes place by a relationship of empathy (or identification) with the mother. Empathy is the mysterious process by which the infant directly assimilates maternal judgments about himself. By identifying himself with the mother, his feelings about himself mirror her feelings towards him. His germinal self-estimations reflect her assessment of him. He converts her valuation into a self-evaluation, maternal approval becoming *self*-approval, and maternal disapproval *self*-disapproval. The mother's feeling for him is the infant's only clue to his own worth. He is not, of course, in any sense clearly aware of judgments which

the mother makes about him, nor is she herself necessarily conscious of what she feels towards him. The infant senses the relationship in a way we can only dimly guess or imagine. In this way he begins to know what the mother wants him or does not want him to do, and thus to learn the most elementary social rules.

The infant's "self" begins to take shape in these experiences of being appraised by his mother, in being approved or disapproved, rewarded or punished, wanted or rejected. If the treatment he undergoes is largely of a derogatory character, he will, by assimilating it, plant in himself the seeds of self-hate. Self-derogation in turn leads to derogation of others, for we are inclined to find in others what we find in ourselves, judging them as we judge ourselves. "By love we do see love, and hate by grievous hate," said Empedocles. We do not seek in another what is not in ourselves. The loveless child becomes the carping, fault-finding adult, for whom fault-finding may even become a substitute for self-criticism.

A characteristic feature of the infant's "self" is a tendency to focus on something of intense interest to the exclusion of everything else. The infant unwittingly obeys the principle of *selective inattention*, as if he were concentrating solely, as though a microscope, on sources of approval or disapproval. This absorption precludes more than a marginal awareness of other experiences. An infant who receives predominantly loving treatment from a parent selectively shuts out awareness of hostile treatment, and *vice versa*. Being loved and loving, like being hated and hating, are twin experiences which monopolise awareness.

The infant normally receives a mixture of affectionate and harsh treatment. Clearly there is an infinite variety of possible mixtures of these two ingredients. If they are bestowed in a random manner, the infant's experiences seem to him inconsistent, and they will be reflected in the uncertain assessment of himself which he later projects into his assessments of others. To the extent that this occurs, unreliable and

ambivalent relationships with others are almost bound to arise.

The infant becomes a child when he begins to master the rudiments of speech. By talking to him we can now more easily infer what evades direct observation and teach him to replace a socially unacceptable pattern of conduct by an acceptable one. Human speech, unlike the built-in mechanisms of communication found in birds and animals, is entirely the outcome of learning, which puts it at the mercy of social pressures. From the outset it is a partial action or inducement to action. Hence the natural affinity between the hands and mouth, revealed in the way children move their tongues about when learning to write. When the child learns to speak, he acquires an incredibly complex pattern of social behaviour. This itself makes speech sensitive to the most delicate upset in the child's mental development and family relationships. If we seldom bother to explain to him the correct meaning of words, he will give them a private meaning. His store of private meanings will provide a rich source of personal symbolism. The infant learns to exploit his voice as a means of exercising power over his surroundings. This use of the voice continues in the child's attempts to control his surroundings by speech, which becomes his main vehicle of social communication. The study of disorders of speech shows how the parent-child relationship may become disrupted. The stammerer employs his disability in order to exert power over the parent (or other listener). His failure to utter a word is a defiance, as if to say: "Don't you dare finish my sentence for me." Some children stammer only in moments of stress. They may stammer only when they speak but not when they sing or recite. Excessively rapid, loud, slow, quiet or diffident speech, as well as stammering itself, may indicate an emotional malaise.

During childhood the "self" becomes differentiated into subselves, into the "good-me," "bad-me" and the "not-me," as Sullivan has designated them. The "good-me" and "bad-me"

are the outcome of parental approvals and disapprovals respectively which the child has empathised; the "not-me" is the outcome of terrifying experiences manifested in nightmares and other dreadful states of mind. If the child is happy, his "good-me" is in control; he is basking in the sun of parental affection. If he is anxious, he is in need of love; the "bad-me" is in control. The rejected child repeatedly experiences disapproval and a time may come when these unpleasant incidents precipitate a sudden "malevolent transformation" in which the "good-me" dramatically gives way to the "bad-me" with its flood of hate and aggressiveness. The child then feels he is surrounded by a hostile world of persons and things.

The child needs parental participation in his play, at least in the role of spectator or audience. Otherwise he becomes lonely and creates imaginary figures to overcome his isolation. His fantasies seem to him real, and in describing them as such he is subject to the danger of being ridiculed. People around him then become unpredictable sources of anxiety and humiliation. Repeated rebuffs in the quest for approval may gravely undermine self-esteem.

Fear of punishment for real or imagined offenses creates fundamental problems for the child. This fear is manipulated by parents and teachers to control the child's conduct. If the punishment consists of inflicting some slight physical pain, it may not do much harm. But if it also causes anxiety, the results may be much more serious. The difference between fear and anxiety is that the circumstances that lead to fear are foreseeable and may be avoided in future, but not those that lead to anxiety. Fears in childhood generate tendencies to conceal, to excuse, to deceive and to propitiate, techniques of precaution which are readily learnt or invented. If the child cannot safely express his anger openly, he will let it smoulder into resentment. He can learn to understand the elements of justice by curbing his impulses so as to receive parental affection. Here the presence of siblings provides special opportunities for just dealings. The only child lacks frequent occasions of "building-in" a sense of justice.

Matters become more complicated when punishment descends on the child "out of the blue" for behaving in a manner which he could not foresee was forbidden. He then discovers that an open show of anger will aggravate the situation and he feels resentment, which is a substitute for anger. If resentment itself is concealed, it is liable to be discharged in indirect and devious ways both mentally and physically. The period of childhood ends at about the age of five or six years, with the emergence of a need for the companionship of playmates of roughly the same age and status. This initiates the juvenile phase.

Unlike the child, the juvenile is not satisfied with his parents or other adults as companions or playmates. Nor is he content to play alone with toys or pets. He now needs children of his own age and sex as playmates, with similar relations towards those in authority, and who engage in the same kind of activities and games. But he himself remains the centre of the picture and seeks the others for his own sake. He co-operates with them as a means to his self-centred ends. In spite of this self-centredness, the juvenile learns to mingle with his equals. This makes it possible for him to form a new self-assessment in the light of their evaluation of him, for he learns at school that parental values are not absolute or ubiquitous.

Juveniles tend to segregate themselves into groups whose members have similar interests, comparable levels of ability and skill, and a common social background. A juvenile who is excluded from a group which has prestige will tend to derogate the group. The greatest hazard facing the juvenile is ostracism by his equals. If he is ostracised, he will try to sustain his self-esteem by disparaging his fellows, supporting his notions of his own worth by running others down. He will think only of the weaknesses of other juveniles and persuade himself that he is at least as good as they. All this gravely interferes with a correct assessment of himself. Unless what he thinks of himself is roughly what others think of him, he is going to be faced with a difficult task when he has to

fit into any group later on and he will be unripe for the intimacy of pre-adolescence at the next stage of development.

When the eighth or ninth year is reached there unfolds a need for an intimate personal relationship with *one* child of the same sex and similar age. This need endures for a comparatively brief phase which ends at puberty. The self-centredness of the juvenile yields in the pre-adolescent to a fully social state. The pre-adolescent does not play games merely for the sake of asserting his superiority and gaining prestige. He shows a capacity to collaborate rather than simply to co-operate with others. He values his friend as highly as himself. He treats him as a loved and trusted equal from whom criticism, however blunt, can be taken, and he discovers that he can express himself freely without fear of ridicule. His clarity of vision is undimmed by absorption with sex which comes with puberty. If ostracism during the juvenile period was not so severe as to rule out a close relationship altogether, it may be corrected by the opportunities afforded by the new intimacy.

If pre-adolescence is for some reason delayed, the juvenile will be ready for it only when his contemporaries have already reached puberty. He will then have to find a younger or older companion to satisfy his need for a warm personal friendship. Such a relationship may easily acquire a homosexual character. The same hazard besets the pre-adolescent who becomes sexually mature though he has not outgrown his close and intimate friendship with a member of the same sex.

It sometimes happens that two juveniles who suffered ostracism may form a close pre-adolescent friendship and thus mutually correct the inadequacies in their development. They may do each other much good. But if their resentment and derogating tendencies persist, they may seek out the most anti-social leadership they can find among local malcontents and so constitute a breeding-ground for juvenile delinquents in the area.

A proper understanding of the peculiar quality of pre-adolescent receptivity, both emotionally and intellectually, is essential for those concerned with the broader issues of education and peace. The transient nature of this receptiveness makes it urgent to cultivate it to the full. For pre-adolescence brings the possibility of seeing oneself through the eyes of another in whom one reposes complete trust. It offers the opportunity of correcting self-estimates warped at any of the earlier stages. Experiences of personal adequacy during this phase makes for ease in social relationships in adult life. If the pre-adolescent has survived previous stages of growth without serious psychological mishap, he is now ready for a first glimmering of what it is to be a "citizen of the world," for he is potentially capable of experiencing a feeling of common humanity, reaching without prejudice across national barriers and geographical frontiers.

Emotional ripeness for collaboration in pre-adolescence finds its intellectual counterpart in what Piaget¹¹ has called the "decentration" and "reciprocity" of thought. He investigated these two processes as they enter into the child's ideas of his homeland and other countries. Discovery of the homeland and understanding of other countries come during the gradual transition from various levels of egocentricity to a full relativity, reversability or reciprocity of thought. At first the child likes any country that appeals to his fancy for purely personal reasons. This is followed by acceptance of the values of the family and local groups and later by a merging with the collective ideals of the community as a whole. But even this conception of the homeland may still be egocentric in relation to other countries and therefore express itself as chauvinism. The realisation that more than one perspective is possible first appears in the pre-adolescent. He grasps that just as he is a foreigner when he is abroad, so a child born in another country is a foreigner only when he travels outside his native land, not while he remains at home.

In concluding this rough outline of the stages of emotional

development I would like to point to the constant hazard which runs like a red thread through all the stages of development. It is the danger of loneliness and its consequences. The infant is lonely if he lacks tenderness and contact with the mother. The child is lonely without parental participation in play and conversation. The juvenile is lonely if he is rejected by his fellows. A more poignant loneliness comes during pre-adolescence with its intense need for intimacy with a single other person. Any companion is better than none, because loneliness is far worse than anxiety. We prefer to be tied to someone we hate rather than be left in isolation. Hatred is a more powerful integrator even than love; someone we hate we pursue and hunt down to the far corners of the earth. The bitter fruit of loneliness is a distorted picture of oneself and therefore also of other people; and the end is a warped person incapable of amicably living with his fellows.

There is one vital aspect of intellectual growth¹² on which I must dwell, if only cursorily, because it is closely linked with emotional development.¹³ The child's ardent desire to know what goes on around him and to participate in it is expressed in his immense capacity for asking questions. When a child asks a question he does not, like the adult, merely pretend he wants to know something. He is not being curious in a blasé sort of way. The adult, having asked a question, can hardly sustain sufficient interest in it to listen to the answer. He may answer it himself or go on to some other irrelevant question. If he can summon the effort to listen to the answer, he is likely to forget it as soon as he has heard it. The child, strange and unaccountable as it may seem to us, asks a question because he really wants to know the answer. Stranger still, he will listen carefully to a genuine answer, and, strangest of all, if it is genuine, he will remember it.

Many children pass through a phase of almost compulsive questioning, for a question means a great deal to a child. He seeks an answer to underpin his little universe, and much harm can be done to him by not giving him a suitable one. If the reply is evasive or otherwise inadequate, he may repeat

the question again and again until he gets a satisfying reply. Alternatively, he may meet every insufficient answer with yet another question. In time, if this goes on, he may, as Kafka once said, forget *what* he first wanted to know and only remember *that* he wanted to know something and did not get an answer. Or, and this is the final disaster, he may eventually lose all zest for asking questions. Evasive answers may, of course, reflect uncertainty in the minds of the parents, and their uncertainty may itself reflect contradictions in the world around them. Conflicting values in society impose antithetical demands on the child—aggressiveness and restraint, assertiveness and modesty, acquisitiveness and thrift, sex as something sinful one day and lawful the next. The child tries to assimilate incompatible notions which he is unable to integrate into a unitary code.¹⁴

A questioning child is often a troublesome child. The Victorian parent's method of dealing with troublesome children was to make them feel morally inferior. By exerting what Samuel Butler called "moral influence," parents and teachers alike incidentally achieved their aim of leading a "quiet life." A favoured practice of the Victorian parent was to imbue his child with a conviction that he was incorrigibly naughty and to hold up a neighbor's child as a paragon without blemish. "How can you fail to appreciate the unique privilege of having been brought into the world by me and not by some other father?" "For whom do I toil and sweat if not for you?" "If I beat you, it hurts me more than it hurts you," formulae which have retained something of the sanctity of tradition. These techniques may be regularly employed in the family which then becomes the "nursery and practice ground of Power."

"Power should first be studied there [in the family]. For nowhere else can despotism be so absolute or so intimate, nowhere can the egoistic lust for bending the will of others to

your own be practiced with such impunity. Nowhere else can the rationalisation of this lust, namely, the identification of your pleasure with 'their good,' be so complete."¹⁵

When power is so boundless as is the parent's power over the child, it is hard not to abuse it sometimes. In this training-ground of Power, the parents are apt to assume for themselves the sole "right to be right," with the result that the child loses the chance of *being himself*. The child cannot be himself if he has to be someone else all the time.

There are many ways in which a child's personality may be distorted. Kafka put his finger on some of the subtler ones. A father may see in his child characteristics of his own which he hates in himself and which he now tries to stamp out of the child, who is more under his control than he is himself. Or he may attempt to hammer his own gifts into the child and so succeed in "hammering the child to pieces." Or he may see in the child characteristics of his wife which he loves in his wife but hates in his child, whom he identifies with himself. A judicious combination of tyranny and slavery tread the child "back into the ground whence it came."

There is a convenient legend of the mindless child. This legend has distinct advantages. We are reluctant to give it up. It saves us from worrying about any undesirable mental effects of our actions on the child and from having to ascribe to him responsibility for any dreadful act he may commit. We refer to the young infant as "it." At some uncertain point of time the "it" becomes a "he" or a "she" and thenceforward is miraculously endowed with mind and responsibility. The age at which the child is credited with a mind is the age at which he must abandon the magical techniques which he has been accustomed to employ in infancy and childhood. But he may have learnt them too well to unlearn them easily.

If a child misbehaves, he is told: "You are a naughty child. Say: I'm sorry." The first effect of such a reprimand is to instil a feeling of being bad. The second effect is to induce the child to perform a magical act. His "I'm sorry" is a form

of lip-service which disengages him from his naughtiness. As Sullivan has remarked, the formula enables him to carry out a magical manipulation. He is quick to learn the enormous advantages of such manipulation which he undergoes at the hands of parents and teachers and which he himself employs in relation to others. These experiences may give him a capacity for technical skill but they probably disqualify him from forming effective human relationships. He comes to learn the various "laws" of manipulation.¹⁶ One is the law of the whip, the importance of sheer physical power. Another is the law of the carrot, by which the child can be brought to believe that it is for his own good to do what his elders want him to do. By skilled use of whip and carrot he becomes, as Bertrand Russell puts it, a "performing animal." Perhaps he grows up in a community of performing animals governed by the whip and the carrot. The whip may be disguised to look like a carrot, itself often a semblance of a real carrot. With the help of a real whip it is not impossible to induce an active pursuit of a sham carrot.

The late Geoffrey Pyke,¹⁷ founder of the famous Malting House School in Cambridge, used to say that the fundamental principle we should follow in dealing with children is to treat every child as a distinguished foreign visitor who knows little or nothing of our language or customs. If we invited a distinguished stranger to tea and he spilled his cup on the best table-cloth or consumed more than his share of cake, we should not upbraid him and send him out of the room. We should hasten to reassure him that all was well. One rude remark from the host would drive the visitor from the room never to be seen again. But we address children constantly in the rudest fashion and yet expect them to behave as models of politeness. If the principle suggested is to prove effective, there must be no exceptions. One rude remark to the child would give the game away.

Parents commonly fail to *understand* their child. So they are unable to communicate with him. They fail to understand what he actually needs and they give him instead what they

think he should need. Even when the infant himself clearly knows what he wants, he cannot necessarily convey his wishes to an adult. When he is a little older and is successful in communicating, he is in no position to enforce his wishes, although he may try to do so. In the first months he makes his wishes known by crying, and he continues to use this technique of control until it is no longer effective. He then replaces it by other forms of control. But he rarely learns how to make a true, direct and effective communication. What he knows is the magic of power, of being manipulated and manipulating. He rarely learns how to understand the other person because he himself hardly knows the experience of *being understood*. He has perhaps never known what it means to have another person make the effort to *understand* him rather than to *control* him.

We can better understand how this state of affairs arises if we study the way parental mores are conveyed to the next generation. Parents and teachers treat children the way they do because it is the only way they know. They transmit *actively* those forms of upbringing which they more or less *passively* underwent when they themselves were young. They hand on what they have themselves received. And by the time the child is, say, ten years old, he has already assimilated the basic mores and values of his elders.

The significance of these early experiences is all the greater because they determine the subsequent relationships which the child will form. He never really leaves his family. He carries it with him through life as a kind of invisible framework, a prototype for all the later relationships which he will form. He will continue to assess himself at the appraisal he received from his parents, and his judgments of others will very largely be projections of his own self-judgment so acquired.

Having outlined the course of development until puberty is reached, it remains to refer to certain basic features in the growth of our perceptual powers which have a direct bearing on the mind and social relationships of the adult.

In infancy we learn to restrict our awareness to what is pleasurable and to exclude that which is distressing. This may be one of the chief habits acquired by the young infant. A painful awareness of an intolerable experience the significance of which we try to conceal from ourselves is called anxiety.¹⁸ The effort to prevent it automatically heightens the tone of the muscles, especially the visceral muscles. Anxiety is the great disturber of the mind, for it interferes with accurate observation, with understanding, foresight and recall and, above all, with any effort to discover what caused it. The circle of consciousness is bounded by anxiety, and the more the themes, topics, activities, relationships and inclinations of everyday life arouse anxiety, the shorter its radius. It is possible that all early forms of anxiety suffered by the infant when he is left alone or finds a stranger in the maternal place derive ultimately from the most basic source of anxiety—separation from the mother.¹⁹

In order to show the bearing of these infant experiences upon adult life, it is necessary to refer to the fundamental difference between the processes of *perception* and *prehension*. If I hear the door-bell ring or look through my window at the building opposite, and, if I am aware, or can make myself aware, of what I hear or see, I then *perceive* the sound or the sight. But if I see someone or something or hear a sound without being aware of seeing or hearing and without the power of controlling the awareness, then I am merely *prehending*. The fact is that our experiences are not necessarily accompanied by consciousness. Potentially we are able to become aware of every experience we undergo. The potentiality is limited by the anxiety that may result from the awareness. Prehension by itself, without the awareness that would convert it into perception, means that the experience is recorded or registered in our bodies without our being conscious of it. We may prehend an event and perceive only a part or aspect of it. Similarly, we may distort part or all of an experience in illusory fashion. In this case we are misreading what is physically registered in us or mis-

interpreting its personal significance. It is relevant to note at this point that a physiological reaction to a stimulus for pain may be demonstrable before the subject is aware of any pain. There appears to be a pupillary response to pain before pain is actually perceived; the dilation has a lower threshold than the algescic experience.²⁰

I should add that anxiety accounts for only part of this selective restriction of perception, and perhaps only a small though vital part. Normally we use and need to use only a very small fraction of the "information" which streams in through our senses. Much of it is redundant. We avoid errors of judgment by sacrificing some sensory "information" which, for mental economy, is sifted largely but unwittingly below the threshold of awareness. It is to the principle of redundancy which governs our sensory apparatus that we owe the relative accuracy with which we judge our sense impressions. Ingoing or afferent nervous channels are five times as many as outgoing or efferent channels, and the flow of motor impulses, which would otherwise become indiscriminate, is internally regulated. Speech is a striking example of the operation of the redundancy principle, for the wave form of uttered speech can be distorted to an amazing degree without loss of intelligibility to the listener. The most dramatic instance of redundancy is, however, to be found in sexual life. Man and animal are alike subject to an almost intolerable pressure in order to realise a biological aim. In the fulfilment of this aim only the tiniest proportion of the abundant energy which is released is actually utilised. But without this enormous tension the aim of nature would probably not be served. Unless man were driven by a powerful sex urge, he would want to make conditions. The surplus of energy blinds him, and gives him the feeling that he is gratifying his own passions when he is serving nature's purposes. In other respects, however, nature reveals herself to be decidedly economical. She is sparing in the number of organs she provides, and some organs must serve several functions. The mouth, for example, is used for eating, spitting, yawning, coughing, singing, vomit-

ing, praying, kissing and smoking. It is sometimes engaged in speech. And whatever else it happens to be doing, it is always involved in breathing, sixteen times a minute, and in secreting saliva, at the rate of two pints a day. It may be a zone of inadequacy, frustration, guilt and aggression. Other parts of the body, internal and external, may similarly perform multiple functions.

Defences against a flooding of consciousness by anxiety are built up during earliest infancy and childhood by the separation of prehensive experience from our perceptual world. But if intolerable experiences are excluded from consciousness, we are not rid of them altogether. They are still with us and something has to be done with them. They have to be *paid for*. Unless payment is made in psychological currency it has to be made by the body. The experiences are stored and the effects released in some physical ailment which may symbolise the original mental event. Or the storage may aggravate rather than discharge the effects. Psychosomatic disorders, especially of a gastric nature, exemplify this kind of phenomenon.

The existence of a prehensive mode of experience in which the organism physiologically registers the "meaning" of what has taken place without the intervention of consciousness complicates all forms of human relationship. It makes possible a relationship which integrates persons in such a way that they interact in terms of meanings which are private and personal to each of them and unshared. In addition to the conscious relationship there is a "shadow" integration consisting of tendencies going on behind the stage of consciousness.

It is not difficult to recognise how these phenomena affect us. Everyone has at some time carried on an audible conversation while at the very same time engaging in a silent or "shadow" conversation with the same person. The two people may have a marginal awareness of the "shadow" or be totally unaware of it, or one of them may be aware and the other unaware; or the degree of awareness may fluctuate.

The two conversations are conducted simultaneously, the "shadow" regulating what is actually being said and heard. The prehended governs the perceived.

In prehensive relationships, apart from tendencies grasped by one or both, there are others which conflict with those available to awareness and which are inaccessible. Either or both persons may be, to a greater or less degree, totally unaware of the "shadow" situation created by these tendencies, in spite of the fact that it influences or controls in detail what is actually happening. One of them may be aware of the other's "shadow" but not of his "shadow's shadow." "Shadow" tendencies provide alternative meanings of situations and relationships. If they are not unified within a dominant meaning, they may live on, apparently unintelligible, as isolated autonomous tendencies within the personality, ranging from conscious conflict to complete dissociation in one of its numerous forms. Permanent interpersonal relationships may be shaped by the experiences built up prehensively. These relationships are called, in more conventional language, "neurotic," which is, as Sullivan has said, "a misleading and much abused word which, with its substantive 'neurosis,' might well be relegated to medical history along with 'humours' and other monuments of discarded theories." Attempts to breathe life into these moribund ideas by introducing figments of factor-analysis, like "neuroticism," are doomed to failure.

Not infrequently, a person is hurt or humiliated so sharply that it is imperative for him not to become aware of the mental injury. There may be other people present when the offending remark is made and the injured one must make no sign even to himself that anything untoward has taken place. In such circumstances he may pay his aggressor back unwittingly on the instalment system. Whenever he meets the aggressor he unfailingly takes the opportunity, "unintentionally" of course, to hit back and so release the tensions stored since the original incident.

We are now able to understand how some people are

able to make a prolonged effort to achieve what they believe to be their goal. For this effort may draw its energy from a prehensive source. Their true goal, of which they are unaware, may be unattainable, but the desire to achieve it provides the energy for the apparent goal. Only when the apparent goal draws near do they realise the futility of past effort. The bluff is called. The feeling remains that they are as far as ever from the true goal. Hence the depression and disillusionment which so often unexpectedly come when success is at hand. A man takes his life at the moment when he has reached the pinnacle of his career. Such displacements may also provide a certain amount of harmless joy. The girl who won a competition to play the part of Lady Godiva illustrated this when replying to the question: "Why do you want to be Lady Godiva?" "Because I am fond of horses," she said!

Finally, it is instructive to compare different countries or communities in respect to the place of children in them. We can distinguish child-centred and adult-centred communities. In the first kind, there is much greater love for children and tolerance for their weaknesses. In the second kind, the life of the family and community primarily serves the needs and wants of the adult; the child has to fit into this scheme as best he can. Almost every aspect of social life can be considered from the point of view of its effects on adults and children respectively, for example, the design of towns and dwellings, the furnishing of houses, traffic control, entertainments, advertisement and so on.

There are communities where orphans and illegitimate and other unfortunate children are housed in institutions maintained at the lowest possible cost. The children suffer for the "sins" or misfortunes of their parents. Their clothes, food and schooling are usually of the poorest quality and they are destined to enter only the most menial of occupations. It used to be a common sight in this country to see the orphan children from the "cottage homes" marked with all the distinction which charitable stigmata could bestow

upon them. Their souls were as closely cropped as their heads, and their minds as dark and dowdy as their clothes. In other communities such children are singled out for the kindest treatment and given every possible compensation for an unfortunate accident of birth or other undeserved affliction.

Italy, perhaps, might be taken as an example of a comparatively child-centred country. There is no need in Italy for a National Society for the Prevention of Cruelty to Children. Cruelty to children is unthinkable there (though not, perhaps, cruelty to animals). No-one need hesitate to take a child to an Italian boarding-house where, indeed, the child is likely to receive more care and attention than his parents. Unfortunately, there are places nearer home where the law for a child is to be seen and not heard, and often not even to be seen.

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2. L. Bertalanffy, *Problems of Life*, London: Watts, 1953.
3. See reference 18, Chapter 4.
4. The only indication, as Lorenz says, that something is due to such a mechanism is if it is a response to a "key-stimulus" or "dummy." Acquired responses are never elicited by dummy stimuli.
5. J. P. Scott, in *Interrelations Between the Social Environment and Psychiatric Disorders*, New York: Millbank Memorial Fund, 1953, pp. 82-102.
6. L. Carmichael, "The Onset and Early Development of Behaviour," in *Manual of Child Psychology*, Carmichael, L. (editor), New York: Wiley, 1946, p. 96.
7. Mary Boole was the wife of the celebrated mathematician, George Boole. I owe to her several suggestions, given in the text, for teaching mathematical ideas.
8. W. Pauli, "The Influence of Archetypal Ideas on Kepler's Theories," in *The Interpretation of Nature and the Psyche*, by C. G. Jung and W. Pauli, translated by R. F. C. Hull and Priscilla Silz, London: Routledge & Kegan Paul, 1955, p. 167.
9. In describing these stages of development I follow the

scheme outlined by the late H. S. Sullivan in his *Conceptions of Modern Psychiatry*, Washington: W. A. White Institute, 1949, and posthumous publications. I had the privilege of meeting him many times towards the end of his life and of discussing his views with him. He impresses many as Freud's most distinguished successor, although he was not himself a Freudian in the narrower sense.

10. For interesting comments on these two approaches see the remarks of Prof. B. Inhelder in *Discussions on Child Development*, I, J. M. Tanner and B. Inhelder (editors), London: Tavistock Publications, 1956.

11. J. Piaget and A. M. Weil, "The Development in Children of the Idea of the Homeland and of Relations with Other Countries," *Internat. Soc. Sci. Bull.*, 1951, III, 561-578.

The following three extracts from Piaget's report illustrate egocentricity and reciprocity at different ages:

Brian S. 6; 2 (English). If you were born without any nationality and you could choose whichever you liked, what country would you choose? English, because I know lots of them. Do you think the English are nicer, not so nice, or just the same as the Swiss? The English are nicer. Why? The Swiss are always quarrelling. If a Swiss child were given a free choice of nationality, what do you think he would choose? He'd choose English. Why? Because I was born there. He couldn't choose any other country? Yes, France perhaps. Why France? It's a lovely country. I've been there on holidays at the seaside. And who do the Swiss think are nicer, the Swiss or the English? The English. Why? Because . . . Why? Because they just are.

Georges B. 7; 5 (Swiss). What nationality have you? I'm Swiss. Are you a foreigner? No. Do you know any foreigners? Yes. Who, for instance? People living a long way off. Now imagine you were travelling in France, could you also become a foreigner in certain ways? No, I'm Swiss. Could a Frenchman be a foreigner? Of course a Frenchman is a foreigner. And is a Frenchman a foreigner in France? Naturally.

Marion B. 12; 4 (Swiss). What is your nationality? I'm Swiss. What is a Swiss person living in Switzerland? Swiss. Is he a foreigner? No, not for the Swiss. What if he goes to France? He's still Swiss, but he'd become a foreigner for the French. And what is a Frenchman in France? French. And what is he if he comes to Switzerland? He's French, but for us he's a foreigner.

12. The reader's attention is drawn to studies we have carried out at Manchester on particular aspects of intellectual development—those belonging to the realm of "subjective probability." We have examined at different ages the child's understanding of independent events, his grasp of statistical reasoning, the confidence he has in judgments based on partial knowledge, and his

use of the language of uncertainty. See J. Cohen and C. E. M. Hansel, "The Idea of a Distribution," *Brit. J. Psychol.*, 1955, 46, 111-121; "The Idea of Independence," *Brit. J. Psychol.*, 1955, 46, 178-190; *Risk and Gambling*, London: Longmans, Green, 1956; "La répartition de probabilités subjectives," *J. de Psychologie*, Maul, 1957, 10-21; (with E. J. Dearnaley) "The Addition of Subjective Probabilities," *Acta Psychol.*, 1956, 12, 371-380; and other recent papers, including "Measures of Subjective Probability," *Brit. J. Psychol.*, 1957; and "A Quantitative Study of Meaning," *Brit. J. Educ. Psychol.*

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15. J. A. Hobson, *Free Thought in the Social Sciences*, New York: Macmillan, 1926, pp. 182-183.

16. Bertrand Russell, *Power*, London: Allen & Unwin, 1938.

17. Later, during World War II, Mr. Pyke served under Lord Mountbatten as Director of Programmes, Combined Operations' Headquarters.

18. Here, too, I adopt Sullivan's conception of anxiety and his theory of prehension.

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20. N. D. Ischlondsky, "Brain Dynamics and Psychic Activity," *J. Nerv. and Ment. Dis.*, 1952, 116, 19-35.

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Chapter 3

The Permitted and Forbidden in Childhood

IN THIS chapter I wish to discuss the part played by "barriers" in the life of the child. This concept was introduced into psychology by the late K. Lewin,¹ whose broad analysis of it will be followed here. Barriers are one of the main causes of frustration, which means not getting what we want, whether we know clearly what we want or not. If we always knew what we wanted and could always get it immediately, life would present few problems. Many of our difficulties are due to the fact that we cannot get what we want and have to be satisfied with the nearest substitute or with nothing at all. The question thus arises: what do we do when we cannot get what we want?

We can distinguish two kinds of frustration, primary and secondary. In primary frustration we cannot get what we want or need, because it is not there. In secondary frustration, what we want is available but, because of some obstacle or barrier, we cannot get it. We shall now consider the various types of barrier and their effects.

The word "barrier" is intended to refer to any kind of psychological or physical obstacle which interferes with what we

want to do. By "psychological" I mean an intellectual, social or moral difficulty which prevents us from doing what we should like. The ease with which a child behaves may be hampered by all sorts of influences—mood, tiredness, the difficulty of the task he is doing, the amount of interest he has in it and so on, and of course there may be obstacles of which he is unaware. The concept of "barrier" is thus a general one and denotes anything which obstructs behaviour or thought whether we are aware of it or not. In this sense it prevents us from initiating or continuing an activity. It is a restraining force in contrast to an inner driving force which impels us towards an activity.

We can distinguish physical, social and mental (or moral) barriers. A physical barrier is a physical obstacle. If the door of a room is locked and I want to enter the room, the locked door is a barrier, but if I have no wish to enter, the locked door is not a barrier. A river is not a barrier for me if I do not wish to get to the other side. A social barrier is any kind of social convention, custom or taboo which prevents our doing the things which we should like to do. If we have no desire to do these things, the convention is not a barrier. A social barrier carries a penalty if it is crossed—a fine, prison, public shame. A moral barrier is effective even if there are no penalties or sanctions attached to it and we have no fear of being found out. The incest taboo is an example of a mental barrier. In one sense a social barrier is like a physical barrier, it is something external to us; in another sense it is like a mental barrier because of its abstract character.

All types of barrier may be defined in terms of three characteristics: their strength, width and definiteness. The strength of a barrier may be measured by the intensity of the effort which is made to overcome it or by the frequency with which substitutes for the true goal are chosen. Barriers may vary in strength ranging from one extreme at which their restraining force is at a minimum to the other where they are insuperable. Barriers to sexual experience vary in this way. At one end there is the completely uninhibited person who freely indulges

himself; for him the barrier has hardly any strength at all. A second person is inhibited in action but feels free to speak. A third person is inhibited from talking about sex as well as in action, and feels free only in sexual fantasy. A fourth may even inhibit fantasy of sex, and be able to release his impulses only in dreams or other indirect or dissociated forms of behaviour.

Barriers may vary in width independently of their strength. Differences in the width of physical barriers may be exemplified by the variations in the width of fences regardless of their height or the difficulty of climbing over them. Social barriers vary in the width of the areas separating permitted and forbidden conduct. For example, there may be few or many stages in a test for a driving licence, and they may be easy or hard. The same applies to the procedures necessary before being admitted to a new social group, such as an exclusive club. Mentally or morally there are variations in the width of the intermediate zone between the thoughts we allow and those we do not allow to enter consciousness.

The definiteness of a barrier means the degree to which it is clearly demarcated. If it is vague, physically, socially or mentally, we may not know which side of the "fence" we are on. Rules of conduct may be perfectly clear to a child or they may be so vague that he does not know whether he is violating them or not. The rules for the payment of income tax or for pedestrian behaviour on a busy highway may be definite or vague. A child may not know whether he is to go to bed precisely at seven o'clock or at any time within a vague period between seven and eight. A speaker may not know whether he is to begin his talk exactly at eight o'clock or whether he is to be allowed fifteen minutes' grace. Various categories of things may be distinguished in our minds clearly or only very dimly.

If all the forbidden things in a child's life had vague and indistinct boundaries, he would be uncertain whether he was doing right or wrong. Feelings of anxiety and insecurity may be the result. Neighbouring though antithetical regions of behaviour become indistinguishable. On the other hand, invari-

able insistence by adults on very clear barriers between approved and disapproved conduct may lead to compulsive habits on the part of the child. The barrier between truth and falsehood may vary from child to child. One child may believe he is very naughty after telling one innocent lie. Even the slightest deviation makes him feel wicked because he possesses no clear line of demarcation between the regions of truth and falsehood. Another child may retain a high opinion of his own truthfulness after telling a hundred lies. For him the line of demarcation is so vague that the regions of truth and falsehood merge into each other. If a parent or teacher interprets a social barrier vaguely and the child interprets it clearly, the child may feel he is being disobedient when actually he is not, and that he is concealing his imaginary disobedience when there is nothing to conceal. The definiteness of a barrier may perhaps be measured in terms of the number of errors made in conforming to rules varying in clarity under constant conditions of intensity and width.

So far we have been considering characteristics of the barrier itself. What are the effects of the barrier on the goal? The main effect seems to be a heightening of its attractiveness, an idea embodied by many proverbs.

H. F. Wright,² who has made a study of this aspect of barriers, quotes the following:

Grass on the other side of the fence is greener.
 Forbidden waters are sweet.
 Love grows with obstacles.
 A fence between makes love more keen.
 The worth of a thing is best known by the want.
 Distance lends charm.
 Absence makes the heart grow fonder.
 Love is equal to the square of the distance.

This enhancement effect is specially apparent in intellectual activity. A child's curiosity and desire for further knowledge

are stimulated by obstacles or by the baffling character of a task, provided the difficulties are not too great. The curiosity provoked by concealing an attractive object entirely or in part may strengthen the desire itself. Those who have read Anatole France's *Penguin Island* will recall his idea of the way women first came to wear clothes, the aim originally having nothing to do with warmth but with concealing parts of the body so as to arouse male inquisitiveness. The arts of female fashion are perhaps based on this idea, which might be designated the "fig-leaf" principle.

The effect of a barrier in enhancing the attractiveness of a goal has led to the suggestion that a barrier is essential for learning to take place. If learning is to be effective, it must not be too easy. This suggestion helps us to understand the differences in intellectual effort which have to be made while learning a task under various kinds of pressure. Three kinds of pressure are commonly used with children: punishment, reward, and interest in the task. The first two, punishment and reward, are external to the situation; the third, interest, is an integral part of it. If a child is induced to learn by a threat of punishment, any attempt on his part to avoid learning is prevented or weakened by his fear of the possible consequences. He is hemmed in by a threat which acts as a barrier to prevent his escape from the situation. If he wants to escape, the barrier which prevents his doing so presumably intensifies his desire to get away and so may be even more disturbing than the absence of a barrier. When a reward is the inducement to learn, a barrier is not needed to escape, because the child wishes to remain "in the field." A barrier is needed only to prevent his trying to get the reward without carrying out the task of learning. In this case the barrier, since it increases the attractiveness of the reward, might distract attention from the task of learning itself. But when the intrinsic attractiveness of the task itself rather than punishment or reward acts as the inducement, no external pressures are needed to keep the child "in the field" and no barriers are needed at all.

The effect of a barrier is not, however, a simple enhancement of the goal. There is at the same time a paradoxical weakening of effort towards the goal. Studies of goal gradients show that as the goal draws nearer the effort to reach it becomes intensified. Now a barrier makes the goal seem less accessible and hence farther away. So there are two antithetical effects: one an enhancement of the goal because of the barrier as impediment; and the other a weakening of effort because the goal seems more remote. Possibly the first of these is the stronger in any given instance.

There is probably an optimal number of barriers that a child can support, that is, an optimal number of "don'ts." Every time we say "don't" to a child we create a barrier. A strong barrier may be consistent with a feeling of being free within the enclosed region. A religious person does not necessarily feel that he is cramped, though his life is full of taboos, provided he willingly accepts the restrictions. If he does not accept them of his own accord, he may feel that his life is limited and circumscribed. It is therefore important to distinguish between barriers which are self-imposed or due to natural limitations, for example, the child's physical weakness, and barriers imposed by someone else or by external rules or agencies. An example of an attempt to *impose* intellectual barriers occurred in Japan. In 1936 the Imperial Japanese Government announced that twenty-two Thought Control Offices were to be set up in Japanese cities. Trained instructors were to lay down what the Japanese were and what they were not to think. Some 60,000 Japanese are said to have been arrested on the charge of thinking dangerous thoughts.

Suppose a barrier is felt by a child to be so strong as to be insuperable, what can he do in such a situation? He may accept the state of affairs, resign himself to the situation and abandon his goal, with or without a feeling of despair. This is perhaps rare. He is more likely to devalue the goal by adopting a cynical or "sour grapes" attitude. Most often perhaps he will choose a vicarious approach to the original goal or choose

another goal. So long as he retains some hope of achieving his goal, and does not regard the barrier as entirely insuperable, he may persist in trying to overcome it either in fantasy or in some more realistic form of behaviour.

An understanding of barriers may therefore be helpful in the practical handling of difficult children. Before treatment can effectively begin, the child must talk. But often he is unwilling to talk, as if readiness to talk were surrounded by barriers. The first task is therefore to weaken these barriers and make conversation free. Sometimes if the child voluntarily breaks down a barrier in relation to one topic, an innocuous one, the barriers to more significant topics may at the same time be undermined. In this connection clothes seem to act as a barrier to readiness to talk. Young children seem more easily induced to speak intimately about themselves when they are undressed, a tendency which seems to remain when they grow older.

Finally there is the state of equilibrium reached if a barrier is experienced as equal in strength to the impulse which it blocks. An example of this kind of equilibrium may be given from what we should perhaps call "social space" rather than the "life space" of the individual. Balzac once declared that the duration of the passion of two persons susceptible to love is in proportion to the original resistance on the part of the woman or to the obstacles which society puts in the way of their desire. If so, the impulse of the male is a function of the barrier he has to overcome, and it increases with growing resistance of the female. Presumably the greater the driving force the longer it will take to be satiated and subside afterwards. And the woman who capitulates after a prolonged siege may be supposed to be driven by a positive force of equal strength to that of the man which comes into its own only when her coyness has vanished. Analogous behaviour is observed in rats. If they are trained to jump a certain distance to get food and then for a time held back from jumping, they make a longer jump afterwards, as if the impulse to jump had

gathered additional strength in the intervening period of frustration. Chimpanzees, too, seem to enjoy a similar disposition. If they are used to press the handle of a spigot to obtain water, they will press with much more than usual effort if the water supply is shut off.³

References

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2. H. F. Wright, "The Influence of Barriers on Strength of Motivation," *Contributions to Psychological Theory*, 1937, I, 3, Durham, N.C.: Duke University Press.
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PART THREE

Chapter 4

The Senses as Social Organs

IN SO FAR AS people think about their sense organs at all, they consider them as kinds of biological gadgets for receiving information from the world outside or from the body itself. At any rate this is what they are told in text-books: the senses are palpable organs which provide us with "knowledge" of an equally palpable universe of things. Before they can yield this knowledge they are supposed to be "triggered off" in automatic fashion by a physical stimulus which activates appropriate nerve fibres. This limited point of view is totally inadequate for a proper understanding of perception, and I would suggest that whatever else our senses are they are also organs whereby we perceive meaning which is personally significant in the world around us. It is true that we use our eyes to see the size, shape, colour and movement of objects. We use them just as much to form social and aesthetic impressions. For it is not the eye that sees, the ear that hears or the skin that responds to touch. It is *we* who see, hear and touch, and we always perceive meaning and values.

With the eye we can carry on a two-way communication.

We can transmit as well as receive messages. The meeting of two eyes may ignite a love spark or establish a mutual hostility. When a Member of Parliament tries to catch the Speaker's eye in the British House of Commons, he employs his visual equipment to establish a favourable social relationship, a task which sometimes seems as hopeless as that of finding favour in "the eyes of the Lord." The teacher establishes control over his pupils by "keeping an eye on them." The social action of the eye at the receiving end is exemplified by the embarrassing effects of being unwillingly stared at; effects which are inexplicable if we think of the eye as nothing more than a physiological organ.

Not only in fiction do we encounter eyes which have a guilty or hunted look, which are piercing or penetrating, or which can read the thoughts of other people. These social qualities are directly perceived and are as "real" to a person as the shoes on his feet. If we may judge from the accounts which Darwin¹ received from observers in Australia, China, India, Africa and America, the expression of guilt and deceit can be recognised on the faces of people living in all these parts. Especially in their eyes can these qualities be identified. Darwin's reporters describe the guilty one as trying to avoid looking at his accuser and as giving him "stolen looks," as turning aside or as wavering from side to side, the eyelids being lowered and partly closed and engaging in restless movements. Darwin observed a guilty expression in the faces of his own children when they were less than three years of age; it was, he thought, manifested by an unusual brightness of the eyes. "I do not need to see the whole of a criminal's face," said Vidocq, organiser of the Paris Criminal Police, "to recognise him as such; it is enough for me to catch his eye."² And Lombroso believed, rightly or wrongly, that the eyes of assassins resemble those of feline animals when they are ambushed, this feline and ferocious glance sometimes alternating with a gentle, almost feminine gaze, a combination giving the assassin a strange power of fascination over women.

The play of the eyes during a conversation between two people reflects the relationship between them. The person addressed may look straight into the other's eyes or, if embarrassed, avert his gaze. The sly person is known by peculiar characteristic movements of the eye. Between two angry persons, "glances cross like swords." By turning a blind eye, an unconscious version of Nelson's technique, we can avoid looking at what we do not wish to see.

The eyes may also be the seat of a purely emotional disturbance, as, for example, in *voyeurism*, visual hallucinations and hysterical blindness, whilst beliefs in the magical power of the Evil Eye vividly illustrate the psychical effects of being looked at.

When we perceive colour we do not just distinguish or appreciate different hues and their combinations. Our feelings are directly and immediately affected by the colours. That is why colours play such an enormous part in our lives, in the choice of clothes, furniture and adornments and decorations of all kinds. A colourless world would be emotionally dreary and drab. Fondness for colour is a sign of health and vitality. When Goya was ill or troubled, he took to etching instead of painting, so as to avoid the impact of colour.

Colours vary in their emotional effect upon us, red being the most powerful. A man in a rage "sees" red. An optimist looks at the world through "rose-coloured" spectacles. Red is the first colour perceived in infancy and the last to fail in hysterical achromatopsia. It is associated with passion, blood, battle; in Sanskrit the word *rakta* means love and sexual excitement as well as the colour red.

The emotional significance of a colour may also vary from one culture or epoch to another. At the beginning of the Christian era a revulsion took place both from red, as the symbol of battle, and from yellow, once the bridal colour, but which came to mean unholy love. The early Christians turned to blue, as the colour of heaven, and blue became sacred to the Madonna.

Even animals seem to be emotionally susceptible to being looked at.³ Fear can, apparently, be induced in monkeys by staring into their eyes or even by getting them to look at drawings of eyes. Köhler's chimpanzees hid their faces when they were shown a stuffed toy animal with black beads or buttons for eyes, but they showed no such reaction when the beads were covered. The artificial eyes seemed to act like "social releasers."

The sense of hearing evolved to respond to vibratory stimuli important for social and sexual life. Birds and most mammals respond to cries of warning from members of their own species, to sounds of sexual excitement in the mate, and to sounds which indicate proximity of the prey. Earliest man no doubt communicated by sound, by uttering warning, threatening or friendly noises.

The ear is less of a social organ than the eye, for it only receives messages; it is a receptor in the strict sense of the word. Perhaps that is why hearing seems more closely linked with the emotions than seeing. There may be a biological basis for this, for it must have been important for our primitive ancestors to be stirred to action by a menacing noise: hence the infant's innate reaction of fear on hearing a loud noise.

Our emotions are more readily aroused by music than by visual art. Contrast the effect of a gay tune or a dirge with the effect of a poster; or the rapturous applause after a concert with the cold, if appreciative, response to an exhibition of paintings. This may be partly due to the fact that the visual object remains outside the observer, whereas the tune becomes, as it were, part of him; the symphony is "taken away" by the listener, whereas the picture must remain on the walls of the art gallery. The visual stimulus exists in space as well as in time; the auditory stimulus exists only in time.

The remarkable capacity of the ear to discriminate sounds has an essentially social significance in the sphere of speech. A word is a pattern of sound which lasts less than a second. An educated person may be able to identify 10,000 of these

fleeting patterns of sound. They do not lose their intelligibility whether they are spoken by a man, woman or child or in different accents or dialects. Even alterations of the voice over the telephone or radio do not destroy the intelligibility of the spoken word.

The social nature of the auditory sense helps us to understand why loss of hearing is so hard to bear; there is no sensory substitute for hearing *in the same way* as the hand can deputise for the eye. Another reason may be that the ears have no natural experience of deafness as the eyes have of blindness, for we have no mechanism for shutting out the audible world as effectively as the eyelids can exclude the visible world.

Auditory experience can assume a symbolic significance for a person, good hearing standing for sexual potency and bad hearing for sexual feebleness. In psychotic women the ear, as an external orifice, may be unconsciously equated with the female genitalia, an equation which also occurs in myths and legends such as the belief in the Madonna's conception through the ear.⁴

The sense of smell came into being during an early stage in the development of the brain. In many species of animal smell is the dominant sense, the olfactory apparatus occupying a proportionately prominent place in the brain. Thus the world of the dog or rat is a world of smell. Since most smells are heavier than air and cling to the ground, the olfactory sense of most species of birds is rudimentary. After man adopted the erect posture, his nose became less important to him than his eye. The relative displacement of the nose by the eye came about through the retention by early man of the ape-like snout at its embryonic stage of development instead of at the adult stage. That is why the human nose is much more like the snout of an embryonic ape than that of an adult ape.⁵

But our olfactory sensibility is still extraordinarily keen, the average person being able to distinguish perhaps fifty or sixty

thousand different odours. He can perceive essence of orange in concentrations of one-twenty-thousandth of a milligram in one litre of air. One three-millionth of a grain of musk will not escape his sharp nose. This shows a much finer discrimination than is possible by the eye with the help of a spectroscope. The sensitivity of the nose is superior in one way even to that of the finger-tips, for it can distinguish between certain chemicals, e.g. disulphide of carbon and hydrogen sulphide, though this is beyond the power of the fingers. Individual differences in sensitivity to smell are, however, very great. Some people are almost as sensitive as dogs, and men appear to be more sensitive than women.

Smell, of all the senses, has the greatest immediate intensity. It is at once the most transitory and the most quickly fatigable. We rapidly get adapted to a particular odour. The fragrance of a flower or a perfume fades almost as soon as it is felt and we have to continue inhaling if we wish to retain it. Most odours are imperceptible after being ten minutes in their presence; negative adaptation is then complete, but recovery of sensibility usually takes place in a matter of a few minutes, the time needed depending on the length of the preceding adaptation. It is this which enables people to work near objectionable smells like those in tanneries and dissecting-rooms; adaptation to one smell may spread to others, but to a lesser degree.

It is remarkable that there are no abstract names for general qualities of smell as there are for other sensory qualities, for example, blue, hot, sour, heavy. The names for different smells are derived from specific substances associated with them, such as coffee or garlic. This lack of abstract words for smell suggests that olfactory experience is intellectually primitive and plays little part in the conceptual activities of the mind. It seems almost as if some taboo prevents our becoming too sharply aware of smell. If so, this may be due to the feeling that smells are animal-like; physical pleasure and disgust are indeed more closely connected with smell and the other prox-

imity senses than with the distance senses, vision and hearing.⁶

A pointer to the symbolic significance of smell in human life is the ancient practice of incense-burning, its central place in religious ritual and the belief that pleasant smells propitiate the gods. And smells, like tastes, often play a large role in descriptions of mystical experience. We still speak of the "odour of sanctity" as well as of its opposite, an "evil odour."⁷

The sense of taste probably evolved from the same original chemical sense as smell, with one set of receptors for both, and they still function in the closest mutual association. Nevertheless it is convenient to discuss taste separately because of its connection with eating, which has a profound social significance and gives rise to unexpected symbolism.

We think of eating as an operation merely involving teeth and jaws. It is not just that. Thus appetite is influenced by psychological factors which determine when, what and how much we eat. It may be aroused, even without pangs of hunger, by seeing others eat. When a mother suckles her infant, in the early months of life, she gives him affection and a feeling of safety as well as food, and the infant enjoys sucking even without drawing milk. This pleasure in oral activity may remain in later years. Because these earliest experiences of being fed have a social character, later on we may be inclined to eat just because we feel lonely. Many of us, like chickens, eat more in company than when alone. An isolated hen that has eaten its usual meal will start to eat again if another hungry hen is placed at the same heap of grain. The additional food it consumes may amount to 60 per cent of the original meal. It will eat still more if *three* additional hens are introduced. But if three hens have eaten their fill, they will not eat any more if a fourth is introduced. Some animals in captivity when kept in isolation lose their appetite and may even die of starvation.⁸

Eating, especially on ceremonial occasions, may have a symbolic significance, and it tends to become a ritual. Its symbolism is often an erotic one. "Such is the way of an

adulterous woman; she eateth, and wipeth her mouth, and saith, I have done no evil" (*Prov. xxx, 20*). A psychotic woman may have fantasies of impregnation as a result of eating. When eating acquires a sexual meaning, it may become a guilty act and revulsion from food may be the outcome.

The origin of the wedding cake may be traced to ritual eating at the marriage banquet. Among some peoples the wedding meal is the only time when the bride and bridegroom eat together. Sometimes the rites on this occasion are expressed by violent movements, the wedding cake being consumed while performing somersaults, like those of the dancing dervishes. Certain tribes of Southern India, according to Briffault, had the custom of rapidly swallowing the marriage meal. Any signs of choking during the meal or of flatulence afterwards were regarded as ominous for the participants. Cannibalism, too, may signify adding to one's prestige by eating part of an enemy or an honoured relative, just as sacrifices offered to the gods were consumed by them, as Jung⁹ has pointed out, because eating "meant" incorporation of things so as to increase one's power. In the mythology of India, the world is "the food of the Gods."¹⁰ We, too, think of eating in this metaphorical sense when we say that a man is "consumed" by his work or by an idea or that he is eaten up by jealousy. The practice of cannibalism has, however, received a less fanciful interpretation. St. Jerome (in *Adversus Jovianium*) tells us that when he was a boy in Gaul he saw "the Attacoti, a British people, eat human flesh; when they come upon herds of swine and cattle and sheep, they slice off the buttocks of the herdsmen and the breasts of the women and esteem them the most delicious of foods."¹¹

Everything connected with eating, from ingestion of food to its elimination, is acutely sensitive to any disturbance in a person's social relationships. The effect may appear at any one of the many stages in the process of digestion: complete loss of appetite or a compulsion to eat to excess, indigestion, vomiting or gastric disorder of one kind or another. These

symptoms, as is well known, have a psychological significance which is expressed in the language of the body.

Finally, it may be noted that many otherwise developed languages are defective in words for tastes as well as for smells and can only describe crude gustatory qualities and differences. In spite of this, in English at any rate, we denote aesthetic sensibility by the word "taste"; the cultivated person is the person of "good taste," a metaphor which perhaps suggests that there is a "higher" order of tasting in addition to the gastronomical.¹²

The traditional method of studying sensitivity to touch is by exploring and mapping the end-organs in the skin which respond to light stimulation. This punctate method does far from justice to our tactile sensibilities because the single point in the skin is not a unit psychologically or even physiologically. Nor is the single point in the relevant part of the brain the appropriate cerebral unit for touch. What is represented in the cerebral cortex is a process, a performance, a movement, or an impression or series of events. These occur in the motor cortex as overlapping representations spread over relatively extensive areas of the brain.¹³

The social and psychological significance of tactile sensibility is borne out, if by nothing else, by the existence of a great cosmetics industry. The skin can be seen and touched. It conveys our feelings—anger, shame, excitement and embarrassment—and its sensitivity to erotic stimulation renders it liable to reveal emotional upset. But the full range of the sense of touch is seen only when we consider it, not in terms of touch spots or specific end-organs, but in relation to the hand. The hand has its own unique forms of perception. It has qualities of expressiveness. It has symbolic value. It is the prototype of human technological ingenuity, and it serves a professional purpose in medicine. We shall briefly discuss these aspects in turn.

The hand can give us at least four different qualities of tactile perception.¹⁴ First, it can give us knowledge of *sur-*

faces, as when we touch wood or metal and feel them to be rough or smooth or soft or hard. Second, it can yield the impression of *space-filling*, as when we dip the hand in a bowl of water. Third, it can give us an *indirect* impression; if, for instance, we try to feel the shape of a key wrapped up in wool, we can clearly perceive the shape of the key without feeling the surface of the intermediate wool. The wool feels transparent. Fourth, the hand can serve as a *probe*. If a needle, pen or screwdriver is manipulated, the impression is felt not in the hand but at the point where the instrument is in contact with the object. The quality of the writing-paper is felt where the nib touches and moves over it. When a doctor or dentist employs a probe to explore a wound or dental cavity, he is using his hand in this way. In all its perceptual qualities the sensitivity of the hand is displayed, not when it remains in stationary contact with an object, but when it *moves* in contact with it. If, for example, you want to imagine what a nylon stocking feels like, you must think of your hand *moving* over the stocking. The hand, that is to say, has haptic rather than merely tactile powers.

The hand is the most eloquent and expressive of all the organs of the body. In the clasp of a hand more can be conveyed than by the eye. Indeed, the hand has certain powers denied even to the eye, for we can impose silence on our eyes, but the hand can never pretend. The hand can have a variety of different qualities: smooth, hard, dry, damp, burning, icy, soft, rough; and each of these may convey a distinct social impression. In contact and gesture it embodies the passing mood of the person as well as his temperament. The variety of manipulations of which the hand is capable has given rise to gesture and finger language in art, mime and ballet. Works of art bear witness to the great fascination which the hand exercises over the painter and sculptor.¹⁵

Writers of fiction, too, are fond of describing the hands of their characters, especially when they have marked peculiarities. In Goncourt's *La Faustin*, there is a character called

Georges Selwyn, a sadist and pervert, who has very curious hands with pointed finger nails. Other writers have described the hands of sadists as soft and whitish and sprinkled with fair hairs or as enormous and covered with yellow hairs. Virginia Woolf describes the Queen's hand in *Orlando* as follows: "It was a memorable hand; a thin hand with long fingers always curling as if round orb or sceptre; a nervous, crabbed, sickly hand; a commanding hand too; a hand that had only to raise itself for a head to fall; . . ." It is significant that we denote the social sense *par excellence* by the word *tact*, originally meaning a delicate touch of the hand. Blake's phrase the "blind hand" tells us that the most dreadful blindness is tactile blindness.¹⁶

The emotional value of the hand varies with the use we put it to, and it may be invested with guilt if it has been used for forbidden purposes. In particular, the hand may have a symbolic meaning. We speak of the "hand of Justice," "the hand of God." We give the hand as a sign of a sacred pledge. The handshake, originally an assurance against striking a stranger, has become a sign of cordiality. The Babylonians regarded the hand as "the seat of strength," and they stretched their fingers when they wished their insults to produce a magical effect. They branded slaves on the hands. The High Priest in the Temple at Jerusalem magically arranged his fingers when bestowing his blessings on the multitude gathered before him. To the Greeks, the hand was the "executive organ" of the body, the embodiment of vitality, a symbol of fertility. A woman, they thought, could become pregnant by being struck on the palm. Folk-lore provides many examples of birth taking place from the hand. Among the Syrian Arabs there used to be widespread belief that the Sheikhs do not engage in ordinary sexual intercourse, but beget their children by movements made with their hands over their wives' bodies. Aeschylus tells us that Zeus begat Epaphos by Io by touching her with his hand. Related to this is the belief that the nails of the fingers and toes are outcrops of the vital fluid of the body

and that the demons came into being from the water which dripped from the finger-tips of Satan when he washed his hands.¹⁷

One early commentator on the *Koran*, no doubt following a more ancient Midrashic source, reveals this belief in the erotic powers of the hand by a gloss on the text describing the affair between Potiphar's wife (Zoleika) and Joseph. The text (*Koran*, chap. xii) reads: "But she [Zoleika] resolved within herself to enjoy him, and he would have resolved to enjoy her, had he not seen the evident demonstration of his Lord." The commentator adds:

"... For they say, that he was so far tempted with his mistress's beauty and enticing behaviour that he sat in her lap, and even began to undress himself, when a voice called to him, and bid him beware of her, but he taking no notice of this admonition, though it was repeated three times, at length the Angel Gabriel, or, as others will have it, the figure of his master, appeared to him; but the more general opinion is that it was the apparition of his father Jacob, who bit his fingers' ends, or, as some write, struck him on the breast, whereupon his lubricity passed out at the ends of his fingers."¹⁸

Jung¹⁹ adduces evidence from mythology of the phallic meaning of the fingers and the hand, and he refers in this connection to the role of the hand in producing fire. He quotes a Bakairi myth, described by Frobenius, in which pregnancy is induced by swallowing finger-bones.

The ancient practice of palmistry embodied the belief that the hand carries mysterious power and secret information. The oldest known writings on chiromancy tell us that before a novice could be admitted into the esoterics of mysticism he had to become an adept in chiromancy. This was associated with a perhaps more realistic study of physiognomy, the original source of which has been traced to a Talmudic interpretation of a phrase in *Isaiah* (iii, 9) "perception of the face."²⁰

In the early history of human invention, the hand played an enormous part. To our primitive ancestors, the hand was a complete kit of tools, including a system of flexible levers. The flat nails, immediate successors to claws, could be used for digging, burrowing, scratching. The fist could be used in pounding, and it formed the prototype of pestle and mortar. At first the fingers moved conjointly. Only later did they acquire independence, the thumb moving sideways, the wrist increasing in flexibility and the index finger assuming priority, especially for probing. The palm could be used for scooping sand or pebbles and for plucking and pulling. In short, the hand is the primeval model of all our important tools.

"The clenched fist represents the hammer, the grasping hand one-half of a pair of tongs, the curved hand the spoon and the spade, the hand with fingers spread out the fork and the rake, and lastly the thumb and index finger in opposition to each other represent the fixed and variable instruments for gauging. Even the most complicated machines imitate the position and movement of the hands and fingers."²¹

Finally, there is the medical role of the hand. Probably the oldest method of healing took the form of placing the hands on the diseased part of the body. Pliny (*Natural History*, Book VII) writes that Phyrrius, King of Apirus, healed the spleen by touching it with the great toe of his right foot; and, according to Tacitus, there was a popular belief in Rome that Vespasian healed the blind by touching their eyes and that Hadrian cured dropsy with a touch of his finger-tips.

Mediaeval chronicles give lengthy accounts of the healing powers of French kings. The eleventh-century French monk, Algaldus, relates that Robert the Pious, King of France, healed the sick by marking the sign of the cross with his hand on the diseased part. Philip de Valois (1293-1350) touched 1500 in one session. Both Philip I (1052-1108) and Louis VI (1081-1137) cured scrofula by touch. This illness has since become known as the "king's evil." As recently as 1824,

when Charles X was crowned, he touched 121 patients. In England, Edward the Confessor treated many victims in this way.²²

In our own day the hand still serves a medical purpose in percussion, palpation and massage, thus having both a diagnostic and a therapeutic function. In percussion one finger is put on the patient's body and is tapped by a finger of the other hand, a technique employed to obtain information about changes in organs, such as the lungs, which are inaccessible to direct inspection. The method does not depend on the sense of hearing, for doctors who are partly deaf use it effectively. Experimental percussion has been studied by means of a "percussion phantom," a box with a cushion and concealed leaden shapes of internal organs. In palpation, an attempt is made to feel through the layers covering the internal organs. Here, however, it is not so much touch as the proprioceptors in the muscles, sinews, and joints which yield the impression of shape; this impression remains even if the tips of the fingers are made insensitive to touch. Massage is a kind of therapeutic palpation in which skilful use of the hands singly or together produces remarkably beneficial effects. The success of the technique is largely due to the elasticity of the muscles, which accounts for the fact that the masseur feels relatively little fatigue.²³

In turning now, with particular diffidence, to the subject of pain, we are faced by the fact that no form of experience has been more recalcitrant to anatomical "explanation." Even the most thorough-going anatomical investigation of pain,²⁴ including end-organs, afferent paths and tracts in the central nervous system, has not achieved very much. The anatomist cannot point to the nucleus or level in the brain which must be reached by the so-called pain-conducting fibres before there can be consciousness of pain. Nor is he able to indicate the precise anatomical features which have to be destroyed before pain will be consciously or unconsciously ignored. The neurophysiological, as contrasted with the purely anatomical,

study of pain has carried our understanding of it a stage further by identifying the kinds of stimulation likely to produce certain obscure forms of pain, for example, in the hollow organs by sudden distension or strong contraction and cardiac pain by anoxia of the myocardium.

The psychological approach to pain can tell us still more, for the simple reason that the distinctive quality of pain is its subjective character.²⁵ To be in pain is to be *aware* of it, and to the extent that our attention is diverted we cannot be said to be in pain. A severely injured person may not notice any "pain," if at the time he is intensely preoccupied. A soldier, badly wounded in battle, may be totally unaware of what has happened until many hours afterwards. Martyrs at the stake or in the torture chamber could bear the ordeal by losing themselves in religious ecstasy. It is said that Gandhi used to allow his teeth to be extracted without an anaesthetic while retaining his composure, because of the extraordinary control which he exercised over his powers of attention. For similar reasons, pain can be reduced by inflicting a second pain; attention is, as it were, split between them; two "smaller" pains then seem less than one "larger" one. When naval officers used to flog sailors for some misdemeanour, the victims took their minds off the pain by biting a piece of lead which they kept in the mouth. Women in childbirth try to divert their attention from the pangs of labour by making their muscles as tense as possible. Some psychotic patients induce in themselves an intense acute pain to distract their minds away from a chronic aching pain.

Attempts have been made to measure such effects of distracting the attention on the threshold of thermal pain induced by radiant heat from a "dolorimeter."²⁶ Thus, a clanging noise, light hypnosis, autosuggestion, reading adventure stories, and repeating series of digits raise the threshold of thermal pain by amounts ranging from 16 to 45 per cent, the units being expressed in *dols*. Experiments with a needle algometer suggest that the threshold of pain rises when the

subject is listening to music. The more the subject appears to be affected by the music, the bigger the effect on the threshold of pain. One subject's threshold was raised by 32 per cent when he listened to Bach's Fugue in E minor, as compared with 14 and 8 per cent when he listened to Liszt's Second Rhapsody and a dance tune respectively.²⁷

It seems possible to be aware of pain without being at all troubled by it. Patients who have undergone pre-frontal lobotomy for intractable pain sometimes say that the pain is still with them but that they are not bothered by it, or even that the pain is in the room somewhere but they are not sure whose it is. It is not that they are unable to perceive any new pain. Their sensitivity may actually be increased, because their threshold is lowered. Awareness of pain and being disturbed by it thus seem to be independent experiences, at any rate in the lobotomised patient.

Apart from deliberately diverting the attention from it, pain may be modified by other impressions occurring at the same time which are beyond the person's control, such as heat or cold or by analgesics. Analgesics are drugs which relieve pain without loss of consciousness. Their precise mode of action is unknown, and they vary in their effects.²⁸ They may raise the threshold to pain, reduce the pain without affecting the threshold, act as sedatives or promote euphoria. Suggestion and hypnosis may produce by purely psychical methods what analgesics bring about pharmacologically.

A full description of a painful experience must specify (i) where it is felt, (ii) what it is like, (iii) how intense it is, and (iv) how it varies with time.²⁹

(i) Pain may be felt in any part of the body, but sensitivity varies considerably from one part to another. It is very great in the cornea, the cavities of the teeth and the arteries; and pricking, scratching, cutting, pressure and extremes of temperature are painfully unpleasant whatever part of the body is affected.

It is easy to localise pain on the surface of the body. If you

ask your friend to close his eyes while you stick a pin into him, he will know exactly where the pin has penetrated. On the other hand, if the source of the pain is some internal organ, localisation is inaccurate because internal pain tends to be referred to other parts of the body, the direction of pain following the way the spinal nerves are distributed. Individuals vary widely in the degree of diffuse muscular tension which they display when in a state of pain.

(ii) A number of diverse qualities may be distinguished in pain: a prick or sting, a clear flash of pain, a burning pain, a sharp or quick pain, a heavy and diffuse ache. Sometimes quality varies with intensity. Thus a prick turns into a burning pain as it becomes more intense. Some qualities of pain only occur in certain parts of the body; for example, quick pain is felt only beneath the finger-nails and in dental and aural cavities.

(iii) Intensity of pain is not necessarily dependent on the strength of the stimulus. While, generally speaking, stronger blows produce deeper wounds, surface wounds tend to be more painful than deeper ones because there are fewer receptors in the deeper tissues. Serious injuries are often unaccompanied by severe pain. A survey during the recent war showed that only about a quarter of severely wounded soldiers requested relief from pain when they were brought to hospital. Their disturbed state seemed to be due not so much to pain but to cerebral anoxia or, more often, to mental distress.³⁰

(iv) Every pain can be characterised temporally by reference to its duration, frequency and rhythm.

What theories have been advanced to explain the complex phenomena of pain? Until a hundred and fifty years ago pain, like pleasure, was believed to be a "passion of the soul," a view inherited from Aristotle. It was plausible because there is no obvious sense organ for pain as there is for the "five senses," nor is pain an experience connected with one part of the body, as vision is with the eye. Pain is even more peculiar in that it is a quality of our experience, not a property of the

pain-inducing object, as the colour red seems the property of a poppy or sweetness the property of sugar.

Since about 1800 there have been two rival explanations of cutaneous pain,³¹ the so-called "intensive" theory and the sensory theory. The first view states that pain is not a unique and distinctive sense experience but a general quality that may affect any of the senses, an intensified experience mediated by any of them. Stimulation of any sense organ, on this view, can provoke pain, provided it reaches a sufficient degree of intensity: a very bright light, a very loud noise, extreme heat or cold—one of these can become painful.

The second view is that pain is not merely an unpleasant exaggeration of other sensory experiences but a specific sense in its own right, on a par with the other special senses, with its own receptors and conduction paths which are totally independent of those for touch, pressure and temperature. This point of view is the one generally favoured to-day.

However well-founded the sensory theory of pain may be so far as it goes, it does not help us to understand the various phenomena whereby pain may be psychically induced, controlled and disregarded. Among the most remarkable of these phenomena are those found among the fakirs and yogi of India, who voluntarily undergo unbelievable torments. Their imperturbability while suffering what seems to be the most horrible and excruciating torture is nothing short of incredible. These facts show that tolerance of pain and the extent to which any outer sign of it must be suppressed are affected by cultural as well as directly by psychical influences.³² Just as inexplicable on the sensory theory are psychogenic pains. These may be vague and intermittent or clear and persistent, and their periodicity differs from that of pains with an organic basis. They are much more influenced by suggestion and psychotherapy, but less responsive to treatment by drugs. Allied to psychogenic pain is pain induced under hypnosis. How can these experiences be explained in terms of pain as a specific sensory experience?

How also can we explain the self-infliction of pain found among low-grade mental defectives and psychotics? Some idiots must have their arms bound to prevent serious self-injury, otherwise they would bite or scratch themselves continuously or beat their heads against a wall. Psychotics sometimes suffer horrible self-mutilations by scalding themselves, eating pieces of glass, avulsing the eyeballs, dislocating or fracturing the fingers, or cutting off the ears (as Van Gogh did). One suicidal patient tore out her eyes, placed hot coals in her lower orifices and armpits and cried out, roaring with laughter: "Now I've got you, you devil."³³

Apart from these difficulties, there are other objections. If pain is simply a sensory experience, why is there no "natural" stimulus for pain as there is for vision, hearing and other senses? Pain is not necessarily associated with injury to tissues, for tissue damage may occur without pain and pain may occur without tissue damage. Furthermore, pain may occur under conditions of reduced sensory input; the pain of a "phantom limb" after amputation may be intense, although under this condition there can be little or no sensory stimulation. Again, while it is true that the cerebral cortex is involved in the experience of pain, as is shown by the fact that anaesthetics and analgesics reduce sensitivity to pain by depressing cerebral processes, there is no special cortical representation of pain as there is for sight, sound, etc. The explanation suggested by Hebb³⁴ attempts to resolve some of these difficulties by assuming that the impulses conducted by "C" fibres become painful only if they disrupt a well-organised pattern of nervous activity. If these impulses are assimilated into an organised neural action, no pain is felt. That is why, he argues, (i) Pavlov's dogs did not seem to suffer pain if they were fed immediately after their skin was cut or burnt; (ii) electric shock administered to rats while they are learning a certain task disrupts the rate of learning, but not if food always follows the shock, in which case the shock becomes part of the organised action, and if the food itself is electrified, the rat

eats with more zest than ever; (iii) a horse spurred by his rider gallops faster, not more slowly, because presumably the pain enters into the total pattern of activity. Much the same kind of integration of pain with pleasurable activity may be assumed to occur in masochism, when sexual pleasure becomes dependent on pain and inseparable from it. It would seem that some such theory as this which interprets the effects of neural stimulation in terms of the total "organised" activity of the organism, accounts for a wider range of the phenomena of pain than the limited sensory or peripheral explanation. It would be an even more satisfactory theory if it recognised that, in the last resort, what matters in causing pain or its absence is the *meaning* of the experience to the organism.

To conclude: Professor L. S. Penrose³⁵ has suggested that the experience of pain may have been the earliest form of consciousness, an idea which recalls Nietzsche's remark that "that remains in memory which never stops hurting." If pain and memory are closely associated in the origin and development of consciousness, the psychical role of pain must be granted a profounder significance than is implied by limiting it to the activity of almost unidentifiable sensory nerve fibres.

I have been mainly concerned in this chapter with a phenomenological description of certain social and personal aspects of sense perception which are overlooked in the usual treatment of the senses as purely psycho-physiological organs. The discussion has been confined to vision, hearing, smell, taste, touch and pain. I have found it desirable to go beyond a phenomenological treatment in the more usual sense of a qualitative analysis of conscious experience and to refer to the symbolism of sense as well as to the emotional significance of sensory activities and their deep involvement in the actual process of working and living. This, I hope, leads to a more comprehensive understanding of the role of the senses in human life.

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Chapter 5

Psychological Time

INNER OR PSYCHOLOGICAL TIME, either as a direct experience or as an aspect of it, is entirely different from physical time, as measured by the clock or calendar. It is subject to variations that cannot occur in physical time, which is independent of experience, and it may hold the key to many mysteries of the mind, in particular memory and certain aspects of thought.

Subjective time includes our *experience* of all the temporal aspects of events in our lives in contrast to a physical record of them, where that is possible, independently of experience. This experience is subject to variations due to such things, for example, as nostalgia, pain, joy, hope, and the workings of memory, which cannot occur in physical time. Certain discrepancies between subjective and physical time are therefore bound to arise. All the same, there is a fundamental concordance between them, and indeed this must be implied in the very idea of human evolution.

Among the many forms of subjective time which we can identify are (i) apparent duration, i.e. how long an event or interval *seems* to last, (ii) experience of the sequence and

"pastness" of events, (iii) temporal localisation, (iv) "sinceness," and (v) "futureness." Something must now be said about each of these forms of temporal experience. I mention these at this point because they are in a way "measurable," but I do not wish to deny psychological reality to non-measurable aspects of time such as, for example, Bergsonian duration in the sense of the experience of a continuous and uninterrupted flow which underlies all succession and change.

Everyone knows that the hands of the dentist's clock crawl and that the days fly when we are on holiday. We overestimate the physical interval in the first case, underestimate it in the second. Under the influence of such drugs as opium and mescaline, in psychosis and in certain physical diseases, these subjective distortions may be enormously magnified. They are only "distortions," of course, from the physicist's point of view. Psychologically they are natural phenomena; they are as real as the desk in front of me and have as much claim to the respectable status of a fact as any other fact in nature.

We must, however, distinguish what normally happens in the hurly-burly of everyday life from our *capacity* to make accurate judgments of duration. When we are relatively free from the influence of strong emotion, the deviation of our subjective estimates from the objective record, though systematic, is not necessarily large. We are more accurate in judging short intervals up to about 5 or 6 seconds than in judging longer intervals. In judging short periods we are able to concentrate on the interval itself directly, but when we estimate minutes or hours we find that the mind wanders, so our judgments become indirect and based on such cues as the number or kind of activities or events that have filled the time.

In judging short intervals there is a systematic tendency to overestimate. We tend to think a second is shorter than it is by clock time. On the average, one second is called 1.5 seconds and 4 seconds is called about 6 seconds. Attempts to construct a scale of subjective duration, as Professor Stevens

of Harvard has observed, show that the subject's ability to distinguish one duration from another varies in different parts of the scale and consequently affects the width of the categories into which he places them. He can easily discriminate 0.5 from 1.0 second, so he puts them in different categories, whereas he tends to put 3.5 seconds and 4.0 seconds in the same category because of his difficulty in distinguishing them.

We do not have to assume that all intervals longer than a few seconds in duration are estimated in the same fashion. Perhaps we have different systems of estimation for intervals of different orders of magnitude—minutes, hours, weeks, months, years. All these estimates are subject to distortion by exaggeration or contraction. And just as we have several distinctive forms of spatial experience—visual, haptic and auditory—so our powers of synchronising events seem to vary from sense to sense. If we compare vision and hearing in this respect, we find that auditory time shows a finer discrimination than visual time. It is perhaps natural that auditory perception should possess a finer temporal sense than visual, because sounds are strung out in time whereas visual displays are spread in space; a point to which I have already referred (Chapter 4). We also seem to have a different memory for each kind of sense. And our diverse sense images vary in their power to evoke the past. Of all the senses, smell is perhaps the sense of memory *par excellence*.

Judgments of duration affect and are affected by other simultaneous experiences. In this respect they resemble well-attested inter-sensory phenomena which reveal the integration and unity of the senses. Thus the *tau-effect*¹ shows that judgments of spatial distances depend on the temporal interval taken to traverse them. If three points (p_1, p_2, p_3) are marked on the subject's skin and the interval of time between stimulating p_2 and p_3 is greater than that between p_1 and p_2 , the subject judges the distance between p_2 and p_3 as greater than that between p_1 and p_2 , though physically it may be equal or less. Similar results are obtained if visual stimuli are substi-

tuted for tactile ones. We have recently demonstrated at Manchester the reverse phenomenon, namely, that temporal judgments of the duration of space-time events are systematically affected by the spatial component. This is now known as the *kappa*-effect.² It may be exemplified as follows: the subject faces a continuous cycle of three separate flashes of light. He can control the timing of the middle flash and has to make the interval of time between the first and second flash equal to that between the second and third. Under these conditions, he allots a shorter time to the larger of the two distances, and the bigger the ratio of the two distances, the shorter, relatively, is the time he allots to the flashes spaced farther apart. If we call the distance between the first and second flashes d_1 , between the second and third flashes d_2 , and the responding intervals of time t_1 and t_2 , then $\frac{t_2}{t_1}$ decreases as $\frac{d_1}{d_2}$ increases. The magnitude of the effect is indicated by the fact that when $\frac{d_2}{d_1}$ is 1/10 the subject underestimates by 12 per cent and when $\frac{d_2}{d_1}$ is 10/1 he overestimates by 13 per cent; and it appears to be influenced by the direction of the flashes of light relative to the Earth, for it is smallest when the lights flash in the upward, greatest in the downward and intermediate in the horizontal direction. From the *tau*- and *kappa*-effects we may conclude that the spatial and temporal components of space-time events are experienced as interdependent. There is therefore a mutual relativity in subjective space-time.

An auditory *kappa* may be produced if the intervals are delimited by auditory pitch instead of by flashes of light. If the subject listens to two different continuous tones and tries to assign an equal duration to each one, he tends to allot a shorter duration to the higher tone, an effect which becomes more marked as the difference between the two tones increases.³

This interdependence in spatio-temporal experience is analogous to the subjective interdependence of auditory pitch and loudness in contrast to the mutual independence of the fre-

quency and intensity of sound-waves. Phenomena such as these conflict with the assumption that experience is composed of separate elements which correspond to autonomous physical dimensions of stimuli, the so-called mind being merely a replica of what is physically presented to the brain. On the contrary, it seems that the qualities of experience have their own intrinsic structure and interrelationships.

I venture at this point to indulge in a momentary play of fanciful digression. This is prompted by recent interest in the relationship between space travel and ageing. It has been suggested that when travelling at velocities close to the speed of light the hypothetical space traveller's metabolism would be slowed down in a way similar to that produced by lowering his temperature. If so, he would age more slowly than his terrestrial friends that he left behind. A further implication is that the duration of his journey, as compared with what clocks on Earth have measured, would seem to him longer than it would to his friends on Earth.⁴

The dependence of judgments of apparent duration upon temperature was first demonstrated in 1928 by François, a pupil of Prof. Henri Piéron, who extended to temporal phenomena the idea underlying the equation of Arrhenius which relates chemical velocity to temperature. If our temperature is raised, we think clock time is passing slowly; if it is lowered, we think it is passing quickly. The behaviour of animals is similarly affected by an increase in temperature; the hearts of cockroaches beat more rapidly and crickets chirp more frequently. But this functional dependence of apparent duration on the velocity of organic process, important though it is, is merely one comparatively simple aspect of subjective time. It does not account for the many sources of variation in subjective time which have nothing to do with temperature. All the same, there may conceivably be some connection between space travel and subjective time. Imagine that something like the *kappa*-effect holds for the experience of movement in inter-planetary voyages. Our traveller must be sub-

jected to acceleration when he embarks and turns round and to deceleration when he lands. His judgment of the duration of the parts of his journey which vary in velocity would then be influenced by the corresponding distances through which he has travelled during the respective intervals. The time spent over the longer distance would seem disproportionately long and the time over the shorter distance disproportionately short, as compared with clocks on the space ship. This might hold true on a smaller scale for a man who flies blindfolded from London to Paris in an hour and continues the journey to Cairo in another hour. The second lap of his journey might seem to him much longer than the first.

I turn now to the experience of sequence and "pastness." The fact that the sequence of two events may be experienced in the reverse order of their physical occurrence was noticed by Ernst Mach, who may be said to have initiated the experimental study of subjective time in his researches into the auditory time sense.⁵ In his study of the sensations twenty years later he declared that "the time of the physicist does not coincide with the system of time sensations"⁶ and he attributed our sense of time to the effort of attention. If, for example, a doctor directs his attention to the patient's blood, he may see it flow before the lancet penetrates the skin.

Normally we are able to recall past experiences or events in a sequence which corresponds roughly, at any rate, to the serial order in which they occurred, each experience having a certain quality of "pastness" associated with it. As Sir Russell Brain⁷ has remarked, this orderly recall is an essential element in the sense of personal identity. It is disrupted in early senile dementia and in certain states of insanity.

The interaction between residues of past experience and what we undergo in the present is one of the aspects of memory which makes possible the survival of perhaps our entire past. Only the part of our past which we can bring to awareness seems to change with the passage of physical time. Repressed material of the unconscious mind may be, as Freud⁸

believed, timeless, unaffected by the flow of years, not chronologically arranged, and lacking other temporal qualities which characterise consciousness.

"It is constantly being borne in upon me," he wrote, "that we have made far too little use in our theory of the indubitable fact that the repressed remains unaltered by the passage of time—this seems to offer us the possibility of an approach to some really profound truths. But I myself have made no further progress here."

Temporal localisation means the ability to locate our earlier experiences in our personal life-histories, placing them in the mental maps of the past. In this respect subjective time resembles touch, whereas in another respect it resembles pain. The likeness to touch lies in the fact that the temporal localisation of an experience is separate and distinct from the mere recollection of it. We can know that something has happened without being able to say *when*, just as we can know *that* we have been touched without knowing *where*.⁹ In another respect, subjective time resembles pain; attention is essential in both types of experience.

By "sinceness" I mean the feeling of how long it seems since a given event. Estimates of elapsed time based on such feelings may show surprisingly little error, even after a period of three days and nights without cues to clock time. An experiment carried out a few years ago, in which two persons were placed for 48 and 86 hours respectively in a sound-proof room without cues for time, showed that the error at the end of the period was only 26 minutes in the case of the first subject and 40 minutes in the case of the second.¹⁰

The experience of "sinceness" may be spatially represented by asking the subject to mark off, on a given line, a length corresponding to the lapse of time since yesterday's lunch, since Christmas, since he left school, etc. Such spatial representation shows a certain pattern. If the lengths of line

marked off for the various periods of elapsed time are plotted against the logarithms of the corresponding chronological intervals, we obtain a straight line. This holds for intervals up to about six months from "now," and conforms with what one would expect on the basis of Weber's law, i.e. that the just noticeable difference in perception occurs when the stimulus is changed by a more or less constant proportion of itself. In the form given to it by Fechner this law may be roughly stated as: perception is proportional to the logarithm of the stimulus. Thus as the actual intervals of time increase logarithmically, the estimates increase in approximately linear fashion. Estimates of intervals up to about six months from "now" show a relative contraction as they become more and more remote from the present. Estimates of intervals greater than a year from "now," however, do not show this contraction. They are more or less linear. Intervals between six months and one year may be estimated by either of the two methods. Thus something that happened an hour or a day ago seems disproportionately remote as compared with a week or month ago, but there is no disproportion when, for example, two years ago are compared with ten years ago.¹¹

An analogous phenomenon of the relative contraction of time is experienced as we get older, the calendar years seeming progressively to shrink. This phenomenon has been linked with biological time, which Lecomte du Nouy has studied in relation to the rate of healing of wounds at different ages. But it has wider implications. Our experiences, as they recede irreversibly into the past, have a changing effect on us, and our inability to cling to the present creates a nostalgia to recapture it when it has fled. The dim past, like the remote future, is enveloped in a rosy glow of phantasy: the Millennium is like a return to the Golden Age of bygone days; both share the same undiluted bliss.¹² In the earliest civilisations man seems to have become aware of the inexorable flow of physical time. The idea of an after-life may indeed have been invented as a counter-measure to stem the tide of time and to prevent the decomposition which follows death. In later

centuries the struggle with physical time took the form of an attempt to arrest the onset of old age. It was once believed that an aged body could recover its youth by the infusion of young blood. Pope Innocent III is said to have tried to rejuvenate himself by transfusing the blood of three young men into his veins. The operation failed. The battle with old age still continues.

Finally, there is the psychological future, without which our lives would be meaningless. We hope, expect, anticipate. Implicit in what we do to-day are plans for to-morrow, for next week, even for years to come. Even in the life of the simplest animal there is what Sherrington¹³ called "a germ of futurity"; thus bees, trained to come for sugar every 24 hours or at more frequent intervals, after a time come in advance, as if anticipating food. The animal's head is surrounded by "a shell of its immediate future" and it is perhaps this relationship to the future which led to the development of the brain. Persons of very low-grade intelligence have an animal-like appreciation of time.¹⁴ Idiots, like fishes or bees, cannot say whether it is morning or afternoon, but they know when it is time for breakfast or lunch. They have an organic knowledge of time. The pre-frontal lobes of the human brain seem to serve our adjustment to possible future events, for pre-frontal leucotomy or lobectomy seems to reduce our capacity for taking the initiative. In human life, hope may be regarded as the counterpart of nostalgia, for it bears a similar relation to the future as nostalgia does to the past. But although life without hope is unthinkable, psychology without hope is not, judging by the conspicuous absence of any study of hope from the literature.

Our apprehension of the future is closely linked with the origins of human speech. A recent hypothesis¹⁵ is that speech came into being during the Upper Paleolithic period, when our ancestors first seem to have displayed an interest in their future. The principal evidence is to be found in the rather sudden development of tools which, unlike the implements of Neanderthal man, were capable of making other tools for

future use. An extensive variety of flint, wooden and bone tools began to appear at this period which stand in striking contrast to the previous hand-axe and flake cultures which had persisted with little change for the previous half-million years. It was possible for this development to be paralleled in the sphere of language. The emotive aspect of a sound symbol is distinct from its intelligibility; in telephonic communication, for example, bands of sound may be used which are so restricted as to divest speech completely of its emotive aspects. So the rapid development of speech may have come about by emphasis on its intelligible aspect which could have a forward as well as a backward reference in time. The emotive aspect of speech refers to the present, the intelligible aspect may also refer to the past and future. With the separation of intelligibility from emotion the possibility of planning ahead as well as the growth of tradition became practicable.

Our sense of the psychological future may be measured in terms of life insurance and savings' schemes. It is conceivable that a worker's temporal horizon may be influenced by the frequency with which he receives his wages. If a daily wage means a daily time-span of planning, a weekly wage a weekly span, and so on, possibly the worker's temporal horizon and his planning for the future might be extended by modifying the frequency of wage payment.¹⁶

Our orientation to the future may show a gradient of tension. We are apt to become increasingly alert as an expected event approaches. The sleeper becomes more and more restless as the pre-appointed moment of waking draws near. An examinee experiences mounting tension as he awaits his results. A pregnant woman awaiting the birth of her child, a bridegroom the marriage ceremony, and a prisoner his execution, all probably undergo a similar increase of tension. Such temporal gradients can sometimes be studied experimentally. Pavlov's dog, trained to receive meat every half-hour, showed by changes in breathing and salivation that he "knew" when the time for the next feeding was due. It can be shown that a

person's ability to recall or recognise tasks which he has begun and left unfinished depends not so much on the amount he has done as on what remains to be done; the less time needed to complete the tasks, the more he is likely to be able to recall them regardless of how much time, within limits, he has spent on them. There is, in other words, a temporal gradient of recall and recognition.¹⁷ Emotionally, there also appears to be a gradient. The late Kurt Lewin noticed that inmates of reformatories tended to become more recalcitrant as the day of their discharge drew near; one person serving a three-year sentence tried to escape within a few days of his release.

There is, incidentally, a characteristic difference between purely temporal gradients in behaviour, on the one hand, and spatial gradients, on the other. We cannot retreat from our next birthday as we can, for instance, from a fire blazing twenty yards ahead. A pathological retreat may sometimes occur when a person refuses to face an issue and regresses to a more primitive form of behaviour. If, however, the coming event depends on ourselves, we can procrastinate, just as we sometimes may be able to ward off a twig that is falling towards us.

Let us dwell now on the many paradoxical features of subjective time. An interval of physical time that is filled with exciting or joyful events usually seems shorter in passing than the same interval filled monotonously or painfully. The difference is noticeable even in intervals of less than a minute. When we look back, these effects are mostly reversed. A period of time spent in learning a single task will seem less than the same amount of time spent in learning several shorter tasks of exactly the same nature as the single task.¹⁸ A familiar journey to many of us seems to take less than one we are making for the first time. The serial order of two events experienced within a given period of time may seem reversed if we attend to one rather than to the other. Similarly, the weaker of two stimuli presented at the same

time will seem to be the later of the two. Bearing these paradoxical features in mind, we cannot equate our experience of the duration and sequence of events with their duration and sequence as measured by a clock independently of our experience. But it is not enough merely to point to the discrepancy between physical and psychological time. Indeed, it would be misleading to speak only of a discrepancy, because, as I have said above, there is also a concordance. Our lives would be chaotic if our experience of duration and sequence bore no relation at all to physical duration and sequence. If this were the case, it would mean that the temporal structure of experience had evolved independently of the rhythms and periodicities of nature. It would mean that natural selection had had no effect on the most deep-rooted quality of our experience. But of course a month normally seems much longer than a week, a week longer than a day, and a day longer than a minute. An understanding of the varied phenomena of psychological time must therefore recognise a certain harmony between "inner" and "outer" time as well as discrepancy.

So far we have been concerned with the forms of personal or private time. There are other variations of a cultural and social nature that are characteristic of different peoples at different levels of culture or civilisation. The basic distinction is between the homogeneity of physical time in modern science and the inhomogeneity of mythological time.¹⁹ For all the cultures of antiquity as well as in the mythologies of all peoples, time has a varying quality. It is divided up into holy and secular, lucky and unlucky periods. Hesiod's *Works and Days* actually includes a religious calendar of the months and a list of days which are favourable or unfavourable for certain occupations. Each day is animated by some personal spirit and one's good or evil fortune on a particular day is due to that day.²⁰ In Homer's *Iliad* the quality of time varies with the seasons and with the weather. It has one value for the victim, and another for the vanquished. Hence it has a quality of fate or destiny experienced by the individual;

and so we find Euripides representing justice as a function of impersonal time. In *Antiope* he calls justice "Time's Daughter"; and in the fragment *Bellerophontes* we meet the lines:

"For Time, who from no Father springs, applies
His levell'd line, and shews man's foul misdeeds."²¹

Among primitive peoples the practical measure of physical time is based on regularly recurring events or tasks of social importance, on social events or tasks—milking, watering, or homecoming of cattle.²² So the division of time varies from tribe to tribe. The Aranda of Western Australia divide the day into twenty-five parts. The Tumerehá Indians reckon the year as ten months plus two further months during which the year is dead. The Cree Indians do not count the days when they cannot see the moon.²³ The lack of a grasp of homogeneity in physical time among these and similar peoples makes it awkward to introduce them to modern ideas of medical treatment. If medicine is prescribed, they do not take it at regular intervals unless these correspond to familiar events like dawn and dusk. Sometimes the entire medicine will be taken in one "magical" dose because the idea of continuing therapy is strange.

Industrial societies need a finer measure than can be given either by social events or even by bodily rhythms, such as the growth of hair or nails or by the menstrual cycle. It is hardly enough to say: "I need a hair-cut, so it must be time to pay my rent."

But there is nothing absolute about our modern conventional divisions of physical time, nor in the value we place upon it, which depends on economic pressures to which we are subject and on the habits of industriousness which we have to cultivate. In countries where indolence is the rule, it is hard to arouse a person to a sense of urgency so that he will do a task quickly, and a person's statement of his age may be wide of the mark because time matters so little.

Within any given culture individuals vary in the value

they attach to their own time, in the extent, for instance, to which they consider waiting to be a waste of time. But in some respects behaviour tends to be uniform. Waiting in a theatre queue makes us more impatient than waiting to see the dentist.

If an individual values his time highly he wants to be in control of it, and this will affect his choice of occupation.²⁴ Some people find it intolerable to have an occupation which begins and stops precisely at a certain minute. They prefer to be tied to a task rather than to the clock. Within any skilled or unskilled occupational group there are differences in the extent to which temporal precision is exacted. Compare a gardener with a worker at a factory where time-and-motion methods are employed. Where workers have to keep to a time schedule, there may still be variations in the amount of temporal latitude allowed them. Work at a factory may begin promptly at 9:00 or vaguely between 9:00 and 9:30. A meeting may start exactly at the time announced or, as in some countries, precisely 15 minutes afterwards. The higher the status of an occupation the less punctuality seems to be demanded. One could hardly be mistaken in identifying the Higher Civil Servant by the lateness of the hour at which he appears in his office, as compared with his clerical underling.

Let us now consider variations in psychological time countered in mentally disturbed persons. Disorders occur in any of the forms of temporal experience described above. Three main types of disorder may be singled out. In the first, there is an extraordinary discrepancy between private time and clock time. The patient's judgments of the duration of physical intervals of time become very erratic. His sense of the passage of time may not function: paretics often believe that they have not grown older since they became infected with syphilis. In "depersonalisation" the immediate past may seem exceedingly remote and the sense of "sincerity" is disjointed. The effect is similar in psychotics who believe after an interval of five minutes that they have been kept waiting six months.

The time sense may also be deranged in physical illness. Patients suffering from Graves' disease are said to underestimate physical duration and those suffering from post-encephalitic Parkinsonism to overestimate it.²⁵ A lesion of the frontal lobes seems to reduce the capacity to distinguish intervals of different length.²⁶

Comparable phenomena may occur when the rhythm of the heart-beat is disturbed. A patient undergoing an attack of *angina* "felt that time stood still and that he was in 'eternity.'"²⁷ Similar disturbances occur in drug addiction. Drugs like mescal, hashish and *cannabis indica* have the effect of prolonging the apparent duration of an event or an experience to an incredible degree. De Quincey tells us that under the influence of opium one night seemed "of a duration far beyond the limits of human experience." A subject given mescaline in our laboratory at Manchester reported that his sense of continuous time was lost. Inner time felt to him so stretched out that it hardly existed, and everything seemed enormously slowed down. Walter de la Mare²⁸ quotes an account of the effect of mescaline given by his novelist friend J. Redwood Anderson. Mr. Anderson's movements and the things in his environment seemed to *him* slowed down but his thoughts seemed greatly speeded up. Actually his movements, though they felt slow to him, seemed to an observer to be feverishly accelerated. When Mr. Anderson got up from his chair to open the door, the observer thought he was moving very quickly, but to Mr. Anderson himself, by the time he found himself in the middle of the room, it seemed years since he had got up from his chair and he could now hardly recollect what he had set out to do. He could judge the duration of physical time intervals quite accurately, even an interval of 5 minutes 37 seconds. What looked like an enormous scale like a tape-measure confronted him in the form of an hallucinatory image, but marked in seconds, minutes and days, instead of in feet and inches. A pointer moved along this scale and all that Mr. Anderson needed to

do, when he was asked to say the time, was to glance at the pointer. The scale seemed to him to have a *real* existence, as real as the trees in the garden.

A second kind of disturbance is found in obsessives who cannot bear the unalterable flow of time and who would like to reverse it, a tendency which also occurs in the state of mind known as *déjà vu*. Obsessives are simultaneously anxious to know the time and not to know it. They detest watches and clocks and also "labour under a compulsion to take note of the most minute details concerning the hours, minutes and seconds."²⁹ Rousseau was an obsessive who wanted to do away with time or bring it to a halt. When he threw away his watch so that it could no longer remind him of the time, he was full of joy and thanked heaven because he would no longer need to know what time of day it was.³⁰ No doubt he would have been happy in Samuel Butler's *Erewhon*, where the mere possession of a watch made one liable to imprisonment.

The flowing quality of time endows it with a sexual significance for some people, both those who hoard their precious time and those who take joy in dissipating it. Their delight in dissipating time has a sexual flavour and it may extend to the dissipation of someone else's time. An erotic element in temporal experience may underlie states of boredom in which there seems to be a conflict between repressed impulses and a craving for more excitement.³¹ In this way the experience of duration may acquire a symbolic value displaced to it from some unconscious source.

A third kind of disturbance is that in which either the sense of *pastness* of events is lost or the memory of their *sequence* is seriously disturbed. A feeling of pastness is essential in every normal recollection of an experience, and events must be recalled in a serial order which corresponds, roughly at least, to the order in which they actually occurred. This time order in the recall of past events and experiences is an integral part of our sense of personal identity.³² It is

disrupted in the Korsakoff syndrome and in early senile dementia. The behaviour of Korsakoff patients under hypnosis suggests that their disorientation in time does not affect elementary temporal judgment of day, night, morning or evening as it does in patients suffering from encephalitis lethargica.

Apart from these three main types of disturbance, misjudgments of psychological time take place under hypnosis. Such distortion can be deliberately induced. A person in a hypnotic trance may imagine that he is engaged in an activity which seems to him to last far longer than it actually does by the clock.³³

Earlier in this chapter I referred to the relationship of time to memory and thought. The hope of shedding a ray of light on the darkness of memory has induced psychologists, since the time of Ebbinghaus, to memorise numberless nonsense syllables. There is some doubt whether the reward for this activity has been commensurate with the effort. We may therefore be forgiven for wondering what has happened to all the nonsense syllables which have been committed to memory. I suppose it would be too farfetched to imagine that they have been regurgitated in the form of psychological text-books.

The conception of memory which is based on what is now known about the nervous system sees it as a rather inefficient filing system for storing information and producing it when necessary. But the manifold forms of memory not only make possible the survival of our past, perhaps, as Freud³⁴ believed, our entire past. They also give rise to a continuous interplay between past and present experience. For just as our past may be at the service of our present, so the present can be remotely controlled by our past, as Shelley expressed it: "Swift as a Thought by the snake Memory stung." In its silent and ceaseless reverberations, memory therefore holds a clue to thought. So we must reject the view that past experience only become significant to us in so far as it helps

us to deal with a present situation, a view implied in the resonance theory of the origin of hypotheses according to which the present needs of a person may throw his past experience into "vibration."³⁵

Memory also endows us with a personal identity. It gives rise to nostalgic experiences which no filing system can simulate. There is an unbroken continuity between past and present experience which bestows a unity on the life-history, a unity which is not simply the effect of a succession of experiences in the same person but a unity of content as well. St. Augustine saw this when he wrote that "thinking consists in reassembling the ideas scattered and dispersed in memory and perhaps bringing them back to the unity of consciousness."

The importance of the temporal aspect of thought in arriving at novel ideas or a new understanding of a situation emerges in a variety of experiments. From this point of view, insight, far from being due to the mind's innate structure, is the outcome of experience. It is the result of linking something which is happening now with something which happened some time ago.³⁶ As such it reveals the working of an historical principle in innovatory thought. This was clearly understood by Samuel Butler³⁷ whose notion of thought was derived from his biological conception of habit and memory. The intellectual life of man, he believed, is governed by the same organic law as the life of the body. Ideas grow and beget other ideas and there is always some resemblance between the parent ideas and their offspring. There is no such thing as a completely new idea immaculately conceived without intellectual ancestry. Nothing comes from nothing. Mental procreation is unconscious and must be allowed to pursue its course without being changed into a conscious hunt after originality. Temporal integration is the key to novel ideas.

There is hence a closer kinship between thought and memory than is implied by treating them as two unrelated proc-

esses. The memory to which I refer is the autobiographical or personal memory rather than the impersonal memory. It is to a novelist like Proust rather than to Ebbinghaus that we have to look for an understanding of autobiographical memory, which will not yield its closely guarded secrets to such methods as the recall of nonsense syllables. We are reminded³⁸ that in Greek mythology Mnemosyne, the goddess of memory, is the mother of the nine muses and the source of all art. The words *muse*, *music*, *memory* (and possibly also *man*) derive from a common root. In German, too, the words *Gedächtnis*, *denken* and *Dichtung* (memory, to think, and poetry) are similarly related.

I conclude: the phenomena encountered in our experience of time are rich in their diversity. They include the experience and judgment of duration, sequence, "pastness," "sinceness," temporal localisation, interaction between the psychological past and present, the temporal paradoxes and pathological distortions. The psychological future is as much a present "reality" as the psychological past. Memory and thought can therefore be better understood in relation to private time and personal identity, and the same applies to the experience of hope and nostalgia. Perhaps more here than elsewhere in psychology it is essential to begin with the qualitative analysis of experience before quantitative methods are introduced. Otherwise matters of great significance are liable to be overlooked, put aside as regrettable errors or got rid of as due to "the troublesome notion of the immediacy of experience."³⁹ For if, the positivist argues, the idea of the immediacy of experience applies to duration, it becomes "an impossible paradox and an obvious introspective fact. The trouble seems to be that what is introspectively obvious is not necessarily true." But what is introspectively obvious must often constitute the basic datum. Whether this datum is true by some external test is scarcely relevant. The curious conclusion to which the positivist's view leads is that the outer world is only an arbitrary division between one

type of sense impression and another and that "what I term myself is only a small sub-division of the vast world of sense-impressions."

Proust once said that there is a psychology of time corresponding to a geometry of space. We may take this to mean that there exist mental structures which are characteristic of psychological time as geometric structures are characteristic of space. The experiments described are an attempt to define and quantify such structures in our experience of time.

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Note: Since this chapter was written, the publication has been announced of a book on the psychology of time by Prof. Paul Fraisse, of the University of Paris. From my acquaintance with Prof. Fraisse's researches, I feel sure that this book will be recognised as a standard work.

PART FOUR

Chapter 6

Personal Thinking

WHEN THE OLD Persian philosopher Avicenna, a thousand years ago, found himself perplexed and unable to grasp the middle term of a syllogism, he would go to the Mosque and implore the Creator of all things to open his understanding and smooth away his difficulties. If he were alive to-day, we could not offer him much better advice. The charge made a quarter of a century ago by Graham Wallas that when the text-books of psychology pass from the simpler to the more elusive mental processes they "become in almost every case entirely useless" is perhaps just as true to-day.

Among the convenient excuses for this backwardness we can include the influence of Francis Bacon, whose method of scientific innovation put the wits of all men on the same level. It left little to individual excellence, because it claimed to perform everything, "by the surest rules and demonstration." If so, it does not matter at all how we think when left to ourselves. All that matters is that we carry out Bacon's recipe for scientific discovery. No wonder Liebig described him as "a scientific dilettante whose writings, pompously

praised by jurists, historians, and others far removed from science, contain nothing of the processes which lead to discovery." Bacon's magic suggests that the discovery of truth automatically follows the collection of enough "facts," which will of themselves yield principles of explanation. It encourages faith in the spontaneous generation of ideas. This faith has many priests in high places whose favourite dictum is "let the facts speak for themselves."¹ But facts are tongueless. They never speak for themselves; and they acquire meaning only when they are gathered in answer to a question.

There are other reasons too, in particular the traditional influences, intellectualism and nativism, which have played successive roles, first as Romulus and Remus, twin progenitors of psychological theory; then, as Castor and Pollux, its guiding stars; and finally, as Scylla and Charybdis, the rocks on which it foundered. The intellectualist tradition conceives mind as a machine for "rational" thinking. A flaw of judgment is merely something to be deplored; it is of no interest in its own right, for logic is the blueprint of psychology. All that we need to discover, therefore, are the formal laws of correct reasoning, not the empirical laws of how we actually think. Logic left its mark in the psychologist's preoccupation with the outcome of mental activity rather than with the activity itself and its motives. His stock-in-trade consists of concepts, judgments, generalisations, abstractions, relations and correlates and other end-products. He occupies himself with the classification of intellectual babies instead of with the study of the pangs of labour, the process of gestation, the act of intellectual procreation and its antecedent states. His approach is retrospective rather than prospective. In this intellectualist tradition there is no place for a *thinker* as distinct from his *thoughts*.

Intellectualism limited the study of thought to what is accessible to awareness. This yielded a very incomplete picture of the nature of thought. For there are several forms of non-conscious mental activity. First, there is the activity which

is normally barred to consciousness and which takes place in regions of the mind accessible only indirectly or on rare occasions. Secondly, there are structures which are implicit in conscious processes. Such thought structures can be traced as they change, stage by stage, through the years of mental development, in the way children understand natural phenomena, mathematical concepts and moral ideas. Thirdly, thought can be non-conscious in the sense that Balzac had in mind when he said: "I have a brain working in two compartments. In the first is the book I am writing. In the second compartment, behind, is another which is writing itself."² This non-conscious element in thinking may be implied in the reply given by a small boy of three and a half years to the question: "What do you do when you think?" He replied: "If someone tells you something hard which you don't know, you have to think what is it. If you don't know what to say, you have to think." After a brief pause, he added: "You just stand quietly and don't say nothing and something comes into your brain."³

"Nativism" is the view that certain aspects of knowledge are given to us independently of experience because of the constitution of the mind. Three criteria are usually regarded as sufficient to determine whether any aspect of knowledge is due to the inborn structure of the mind. As stated by C. C. Pratt⁴ they are: (i) universality, if the same judgment is made by all people regardless of age or background, (ii) uniformity as between man and animal, and (iii) strict dependence on some stimulus, a given relative difference between two stimuli always producing the same relative difference in response. Now nativism is a reasonable explanation for certain features in perception which are closely bound to the stimulus, such as the size or colour of objects. It has little relevance to processes of thought, which are free and unfettered and in no sense tied or governed by some external stimulus.

Some empirical explanation had therefore to be invoked

to explain how we think, in place of a mental structure which is supposedly innate. Empiricism was an advance on nativism because it recognised the part played by experience in shaping the mind. The new feature in empiricism was to allow for past influences. In spite of this, as an explanation of thought it is defective in two respects, in its "atomistic" conception of mental activity and in its passivity. The first weakness was met by *Gestalt* theory in the suggestion that our thinking is organised from the very start. In denying the existence of primary sensory atoms or elements, *Gestalt* theory escaped the obligation to explain how they were combined. But the second weakness remained. The contribution of *Gestalt* theory was therefore not as startling as appeared at first sight. It substituted *organised* for *atomistic* passivity. Certainly it insisted on the idea of experience as something structured from the beginning. But in abandoning the notion of cumulative experience and reverting to nativism in thought as well as in perception, it lost the principal advantage of empiricism over nativism. Unlike Helmholtz, who, by his theory of unconscious inference, had tried to explain perception in terms of thought, *Gestalt* theory tried to explain thought in terms of perception. The nativism which it assumed to determine perceptual organisation was stretched too far.

The *Gestalt* view of thinking as a passive, if organised, process led to the belief that the proper experimental arrangement for studying it is to ignore the life-history of the subject while controlling the situation in which he is placed. The problem and its solution are supposed to be embedded in the situation. The thinker has to become a midwife and discharge his "obstetric" task of solving the problem by extracting the solution.⁵ Thus there arose the idea that thinking and problem-solving are one and the same thing. In American psychology this has become a widely current cliché. Thinking, it is said, is "whatever happens when individuals solve problems" or "the inside story of problem-

solving on its higher levels" or "problem-solving with symbols" or "verbal problem-solving." If thinking and problem-solving are one and the same thing, what becomes of the process of detecting or identifying problems which is first and foremost the essential task of the thinker? Once the problem has been identified, its solution is usually a matter of communicable technique; far more difficult is the task of identifying it in the first instance.

As an example of problem-detection somewhat removed from the maze-running of rats, I should like to refer to the invention, by Geoffrey Pyke,⁶ of the iceberg-ship *Habakkuk*, perhaps the greatest secret weapon of World War II. In 1941 Britain was losing ships at a far greater rate than she was building them. In addition, vast quantities of food-stuffs, essential raw materials, and equipment were being lost, and the situation was exceedingly grave. One major effect of the shipping losses was that it was impossible to concentrate sufficient aircraft or warships to prepare for invading the Continent. Mr. Pyke began by wondering whether it would not be possible to find a single answer to these difficulties. He argued thus: if our ships are not to be sunk, we must build unsinkable ships. To be unsinkable they must be made of material that can withstand the heaviest bombs and torpedoes. Such material must also be accessible in sufficient quantity and cheap. What material exists which is (i) unsinkable, (ii) available in quantity, and (iii) cheap? Ice. But ice melts in warm water! A way must be found of treating it chemically to make it unmeltable. Ice splinters! The treatment must be extended to prevent splintering. Proceeding thus step by step, Geoffrey Pyke managed eventually with the aid of his scientific collaborators to make ice unmeltable and unsplinterable. The substance was named Pykrete. An obstacle remained. The rate of travel across the Atlantic was too slow. This meant that large numbers of vessels, even though they could be constructed of Pykrete, would be tied up in importing the needed food and raw materials. The answer

was to make one enormous vessel, twenty-five times as large as the *Queen Mary*, with a displacement of 2 million tons, that could sail from the Arctic to the Equator. Such a giant could transport a year's supply of food and raw materials, as well as many thousands of men and aircraft in a single voyage from the United States to England. It could also act as an impregnable aircraft-carrier, a man-made unsinkable island. Pyke planned a whole fleet of such ships, and it was only the invention of the atomic bomb which caused the scheme, though well advanced, to be interrupted. His plan was held up for a considerable time by officials, who raised one difficulty after another, in spite of the fact that it had the full support of Lord Mountbatten and Sir Winston Churchill.

With this example in mind, let us ask a more general question: what makes a particular thought occur to a particular person at a particular time and place? What, in other words, determines the natural history of an idea? These questions draw attention to two aspects of thought: first, its unique, distinctive and individual character and, second, its historical quality; every thought has a history of its own and is the end product of a cumulative experience. The experimental study of thought has, in the past, made sure that these two aspects are ignored. The missing first aspect amounts to an attempt to scrutinise a person's thoughts in his absence. The thinker as a person makes no appearance on a stage in which he should be the principal character. His intellectual activities are supposed to cohere in a personal vacuum. The missing second aspect makes it a timeless vacuum as well. The more temporally extended the thinking, the more it has eluded study. Experience has been broken up into tiny fragments, and the "units" chosen for study under the psychological microscope have endured only for a brief period, thus destroying the living reality by a tachistoscopic fragmentation. So the temporal quality of experience and its relation to thought have escaped the experimenter.

The plain fact is that what little grasp we have of the na-

ture of thought we owe not to the psychological experimenter but to men gifted with an intuitive understanding of their own mental life, to poets and novelists like Keats and Proust, to scientists and mathematicians like Helmholtz, Poincaré and Hadamard, to Graham Wallas, a political theorist, and in particular to Freud's clinical insight.

The question just posed was provoked during an international conference on "mental health" at which I acted as observer.⁷ One of the participants proposed that at future meetings of the organisation, delegates should be invited not only from nations which belonged to U.N. but also from socially isolated Colonial peoples. Why should this particular delegate out of the two hundred present make this suggestion at a particular stage in the conference proceedings? On pursuing this question it emerged that the delegate had herself from childhood onwards experienced intense feelings of isolation. During the course of the conference, especially as a result of discussions in a small group, when problems of personal relationships were rather searchingly probed, she had gained some insight into her own state of mind and become aware of the way her loneliness had diminished as a result of her participation in the conference. She recognised in her new situation the meaning of previous experiences, and the thought immediately occurred to her that others might similarly benefit. The impact of a constellation of factors on this person with a particular life-history evoked a thought which could occur to her and to no other. This example suggests that when an idea first appears in consciousness it may actually be the end result of an experience extending over months or years.

This instance brings to mind a remark of Claude Bernard⁸ that feeling always takes the initiative in thought. If so, it is an error to believe that thought has little or no connection with feeling, an error characteristic of the obsessive mind. The obsessive does not want his feelings to be aroused, so he replaces them with thoughts and words. He constructs a

private world of shadows, a symbolical model of order, a system, a verbal replica of the real world.⁹ He tries to control the real world by learning the names of things and, if necessary, by inventing new names. An obsessive patient who, as a child, had been afraid of storks, learnt the names of hundreds of different kinds of birds. Similarly those guarded "psychologists" who resent any intrusion into their own or anyone else's inner life, learn the names of all the minute parts of the nervous system. These attempts will fail because in time the names acquire the emotional value of what they stand for.

There are a variety of pointers to the fact that our thoughts are characterised in a personal fashion. We cannot do our thinking by proxy. If we are to profit either from the detection or the solution of problems, we must ourselves follow each step towards the goal.¹⁰ It is useless for someone to present a ready-made answer without explaining how it is reached. A child will not learn much arithmetic if he is given the correct solutions without being shown how to work them out, any more than a person suddenly and instantaneously transplanted to some unfamiliar railway station would be able to find his way there alone afterwards.

Not only must the thinker himself follow the path to the solution; he must also make his *own* mistakes. There is not much point in demonstrating the mistakes other people are liable to make. This is true of animals as well. Suppose a rat is trained to run the correct path through a maze, the blind alleys of which are all blocked. If, later, the blocks are removed, the rat will enter the blind alleys as if beginning to learn the maze afresh.¹¹ The learner or thinker must be his own guide. A constant directing hand on his shoulder will not prevent his going astray when the hand is withdrawn.

A striking example of the way a particular idea is characteristic of the mind which gave it birth occurs in the sphere of mathematical discovery. The square of any number, positive or negative, is a positive number, and for centuries the apparent absurdity of the expression $x = \sqrt{-1}$ prevented its

use by Hindu and Arab mathematicians as a root of the equation $x^2 + 1 = 0$. It was not until the year 1545 that someone bold enough appeared who had the intellectual courage to face this situation. The Italian mathematician Cardano deliberately committed the absurdity and dared to speak of the square roots of negative numbers which he called "imaginary quantities." Although this seemed to be sheer perversity, it was an essential step for the subsequent development of algebra. Cardano was a man of strange and wild temperament. He was fascinated by intellectual "perversity" and "crazy" ideas. Far from ignoring this fact, it is of the greatest interest to us if we wish to know why he and not anyone else discovered "imaginary quantities."

"It could be naturally expected," writes Hadamard, "that the discovery of imaginaries which seems nearer to madness than to logic, and which, in fact, has illuminated the whole of mathematical science, would come from such a man whose adventurous life was not always commendable from the moral point of view, and who from childhood suffered from fantastic hallucinations to such an extent that he was chosen by Lombroso as a typical example in the chapter "Genius and Insanity" of his book on *The Man of Genius*."¹²

The fact that imaginaries now constitute part of the objective content of mathematical science does not debar the study of their origin from qualifying as a legitimate subject of scientific enquiry.

The revolutionary discovery of Boolean algebra was similarly made possible by the strange character of its author. Boole's aim, his wife relates,¹³ "was to unfold the secret laws and relations of those high faculties of thought by which all beyond the merely perceptive knowledge of the world and of ourselves is attained or matured," and he was particularly anxious "to investigate the fundamental laws of those operations of the mind by which reasoning is performed." We are

told how his "Mystic Law" ($x + (\text{not } -x) = 1$) flashed across his mind one afternoon suddenly as he was crossing a field (in 1832 or 1833).

"It was the mystic secret," writes Mary Boole, "the open secret of all the ages; the same which has been known to all great Seers, Mystics, Religion-Founders from the dawn of History, viz. that the mind of man is encased in a mechanism which, besides receiving impressions through what we call the senses, receives information also from some source, invisible and undefinable, access to which opens whenever the mind, after a period of tension in the difference, contrast, or conflict between any elements of thought, turns to contemplate the same elements as united, or as forming part of a unity."¹⁴

The same link between a man's character and his thoughts is illustrated in the life of Jeremy Bentham, where it appears not just in one idea but in his entire work. We are told that Bentham was never interested in real problems of living. What he worried about was rather the "mechanism of living" and "his reforms were a series of political gadgets." We understand Bentham better when we hear what John Stuart Mill had to say about him:

"He had neither internal experience nor external. . . . He never knew prosperity and adversity, passion nor satiety; he never had even the experiences which sickness gives; he knew no dejection, no heaviness of heart. He never felt life a sore and weary burden. He was a boy to the last."¹⁵

As a third example I should like to refer to the difference in outlook between Sir Humphry Davy and Wollaston as observed by their mutual friend Babbage. One morning Babbage met Wollaston in a bookshop and asked him this question: If two volumes of hydrogen and one of oxygen are mixed in a vessel, and if they are so condensed by pressure as to have the same specific gravity as water, would

they unite and form water? Wollaston replied that he did not think they would unite, and when he was asked whether the experiment was worth making, he replied that he did not think so because it would certainly *not* succeed. When Davy was asked the same questions a few days later, he said immediately that the gases *would* unite and that it was hardly necessary to make the experiment because it *must* succeed.

Babbage was fond of comparing the intellectual qualities of these two great chemists. He attributed Wollaston's precision in scientific matters to a cautious moral character, together with an astonishing capacity for drawing a clear line between what he did and what he did not know, a capacity to recognise the exact boundaries of his own knowledge. Wollaston's overriding desire was to avoid making a mistake; Davy's great passion was to discover and publish some new truth, and with the intuition of a poet he was able to grasp even the remotest conclusions to which a theory led him.¹⁶ The "monumental example," as Gasset¹⁷ has pointed out, is Descartes' *Discourse on Method*. "The Discourse—opening theme of the symphony of modern thinking—is an autobiography. In it Descartes tells us which experiences of his life led to the discovery of his philosophy."

Common sense, indeed, tells us that a man's personality is reflected in the kind of philosophy he creates. Fichte¹⁸ accepted the commonsense view when he wrote: "The kind of philosophy a man chooses depends upon the kind of man he is. For a philosophic system is no piece of dead furniture one can acquire and discard at will. It is animated with the spirit of the man who possesses it." Gasset¹⁹ shares this view in speaking of those historians of philosophy who describe systems of thought as though they had emanated from the minds of "Unknown Philosophers," anonymous and abstract creatures outside time and space: "into the phrase 'Kant's philosophy' Kant enters not in the concrete role of the person who did the philosophising but as an adventitious name connected with a philosophy. Yet the true and real philosophy of Kant is inseparable from the man."

Cassirer,²⁰ on the other hand, appears to believe that the individuality of a philosopher does not impress its stamp on his ideas, and he supports this statement by referring to the profound mutual understanding that existed between Kant and Rousseau, who seemed to be poles apart in temperament as well as in social rank. Kant, the stern and Spartan thinker, dreading change of any kind, contrasts hugely with Rousseau, who could write only in the intoxication of passion and wanderlust. But we should surely distinguish between "mutual understanding" and the preference for a particular philosophy. What could be more different from Kant's categorical imperatives than Rousseau's plea for a return to "nature"? Actually, Cassirer²¹ elsewhere agrees that *scientific* discovery "bears the stamp of the individual mind of its author. In it we find not merely a new objective aspect of things but also an individual attitude of mind and even a personal style." But while this, he declares, is of psychological interest it has no systematic relevance; "in the objective content of science these individual features are forgotten and effaced, for one of the principal aims of scientific thought is the elimination of all personal and anthropomorphic ideas." The expression "forgotten and effaced" is misleading. Individual features may be irrelevant when we come to evaluate the content of science, but they constitute in themselves a legitimate subject for scientific study the results of which will provide a different content. The psychology of thought cannot afford to forget and efface the personal factors which lead to the discovery of impersonal content.

There is a wider sense in which early experiences influence the creative imagination in later years, as exemplified in the poetry of Keats. We find in Keats' poems countless allusions to food: "roots of relish sweet and honey wild and manna dew," "Canary wine," "juicy pears," "dainty pies," "ripening fruits," "honey crammed cells," "oozing cider press." Food and eating are closely linked in his poems with erotic experience. All his heroines are associated with sumptuous

banquets or exotic fruits.²² This is not mere coincidence, but the working-out in poetic art of events that affected Keats deeply in earliest infancy and childhood. Indeed, "memory," writes Stephen Spender,²³ "exercised in a particular way is the natural gift of poetic genius. The poet, above all else, is a person who never forgets certain sense impressions which he has experienced and which he can re-live again and again as though with all their original freshness."

The classical study of the ontogenetic factor in creative work is Lowes's *Road to Xanadu*, in which he makes a minute examination of Coleridge's notebooks. For years Coleridge evidently stocked his mind with a wide range of information and details of observation, and he constantly experimented with rhymes and metres. The "Ancient Mariner" did not spring suddenly from his brain like some Minerva, but was the result of a slow and laborious process of historical growth.

The life of Freud himself provides a further illustration. When he was 14 years old, he was presented with the work of Ludwig Börne who in 1823 had devised a quick recipe for becoming an original writer. One had to take a few sheets of paper and write down for three days in succession, without falsification or hypocrisy, everything that came into one's head. This device fascinated the young Freud and it may have been the germ of the method of free association which he later invented²⁴ and employed in his many investigations. Faraday was the supreme example of a man who was able to do this because he enjoyed a marvellous intellectual mobility and freedom from mental barriers. He was tireless in pondering on analogies between the known and unknown. Nothing seemed to him impossible before it had been put to the test; the most incredible things seemed credible.²⁵ By contrast, the boldness of Freud consisted in the dispassionate analysis of material marked by a massive social taboo. Try to imagine some eminent Victorian, like Dr. Arnold of Rugby, shocking his contemporaries by announcing a sexual

theory of dreams! It is easy to see that Freud's achievements were barred to anyone who did not share at least his extraordinary moral fearlessness.²⁶

The individuality of our thoughts is destroyed if we allow our minds to become dominated by the ideas of other people. This seems to be the meaning of Proust's parable *L'Étranger*. A gifted young man, Dominique, is always surrounded by a circle of admirers. Once when Dominique is alone, a stranger comes and reproaches him for receiving everyone except himself. Dominique, intrigued by the stranger, promises to include him among his friends. The stranger replies: "You must send away your other friends." "This I cannot do," says the young man, "because I cannot be alone." "Choose quickly," warns the stranger, just as the other guests are arriving. "Who are you?" Dominique cries out to him. Sorrowfully the reply comes: "I am your soul. I am yourself."²⁷

Indeed we can contribute little of intellectual value to the community in which we live unless we cultivate our own thoughts. A million minds with a single idea provide ideal material for a political party, but they are not much use for anything else. If there is no magic recipe for getting original ideas, we can at any rate try to use our mental resources to better purpose. A touch of audacity helps. This is very different from arrogance or insolence. Unfortunately, few of us retain the adventurousness and boldness of mind we displayed as children of four or five years of age, before we received the benefits of formal education. At that tender age we were abashed by nothing. Fertile thinking needs the child's eager disposition to question all things, for a discovery can only be made if we regard as merely probable or possible what was previously accepted as established fact.

Intellectual audacity could prevent ourselves becoming cluttered up with borrowed ideas which do no more than disrupt our own. Cajal²⁸ sagely remarked that a docile and excessively humble man may become a saint, but he cannot become a man of science. Had Vesalius, Eustachio and

Harvey been more submissive, they would not have revolted against the ideas of Galen, nor would Copernicus have overthrown the system of Ptolemy. Extreme humility clouds the critical understanding. It goes without saying that audacity without intellectual content is not enough, except in politics, where it guarantees dazzling success.

Next to audacity, it is good to cultivate a labile personality, for this seems to be associated with fertility in invention. A conceptual spark is more likely to ignite in the mind of a person who passes easily from one train of thought to another than in a person whose compartments of thought are carefully insulated from one another. Hence the significance of Köhler's remark that "trespassing is one of the most successful techniques in science."²⁹ The more our thoughts freely scatter, the more likely it is that ideas on widely different topics will make contact and fertilise one another. One must naturally beware of the danger of becoming merely scatter-brained. Whether we can think freely about a given subject depends partly on how much shame, guilt, fear or prejudice is associated with it. Lichtenberg³⁰ was well aware of the importance of mental mobility when he wrote: "If I could only make canals in my head to promote some traffic between my stores of thought! But there they lie in hundreds without being of any use to one another." Clerk Maxwell, the greatest theoretical physicist of the nineteenth century, possessed this quality of intellectual mobility in the highest degree. His biographer³¹ tells us that his special gift consisted in being able to dissolve any intellectual "mould" as soon as it had served its purpose. In struggling to give shape to a new idea the effort needed is so large that the mind takes on a permanent mould. In Maxwell these moulds endured only as long as they were useful. In particular, his mental mobility showed itself in his freedom from domination by visual models of the engineering imagination.

In emphasising the ontogenesis of thought, I do not, of course, imply that there can be any spontaneous generation

of ideas in the sense that an individual owes nothing to his predecessors. Just as an individual's private thoughts have a personal history, so ideas in every realm of knowledge have a social history. Legend tells us that the first pair of tongs was made on the sixth day of creation and that every such tool made since then has been shaped by a pair of tongs already in existence. Like every tool, every idea has its genealogy;³² and just as the tool has its progenitors, so each idea is descended from other ideas. This temporal aspect of thought has been touched on in chapter 5. Let us remind ourselves again of Gasset's words: "The minds of men," he writes, "do not throw up sudden stray ideas without ancestors or precedents. History is perfect continuity. Every idea of mine springs from another idea of mine or of someone else, and in its turn gives birth to further ideas."³³ Ancestral ideas may provide the fertile soil from which creative ideas may grow. In the physical and physiological sciences such ideas germinate when there is observation of a natural phenomenon. In the human sciences, they may originate in the investigator's own experience. A single profound experience may be the source of many significant discoveries. We can learn much from books, but we learn more from nature, outside us or within us. Proust seems to have thought so if we may judge from the following passage:

"A man who falls into bed like a log, and lies there as though dead until he awakes in the morning when it is time to get up, can never expect to make—I won't say discoveries of major importance—but even a few comments on the nature of sleep. A dose of insomnia is of no little value to those who would appreciate the gift of sleep, who would seek to cast the feeblest ray into that mysterious darkness."³⁴

I suspect that Proust's remark was prompted by the action of a publisher who rejected Proust's novel because he could not understand why anyone needed to devote thirty pages to a description of the process of falling asleep.

Individuality expresses itself in idiosyncrasies of work habits.³⁵ We can picture Rousseau working bare-headed in the full blaze of the sun so as to increase the flow of blood to the brain. Bossuet preferred a cold room with his head wrapped up. Schiller sat with his feet immersed in cold water, and his efforts seem to have been invigorated by the smell of decay—fading autumnal leaves, the sepulchral odour of the churchyard or a collection of rotten apples in his desk. Descartes and Leibniz worked in horizontal posture. Bishop Jansenais walked about and followed his thoughts “in the midst of the noise of festivals as well as in silence and darkness.” Balzac, garbed in a monk’s cowl, consumed enormous quantities of fresh fruit and struggled right through the night; this continued for long periods while the inspiration lasted. Some prefer to work best at night, others while lying in bed late in the morning. One may be immobile and inert. Another may shut himself in a room and shout and rush about like a madman.³⁶ A third likes to pace up and down, presumably on the dictum of Augier that “the legs are the wheels of thought.” There are also variations in muscular tone, and in preference for a tense or a relaxed state. Complete mental relaxation is rarely associated with intellectual activity of a high order.

We have not been concerned in this chapter with the logical, moral or social quality of the final products of thought, in other words, with classifying the ripe apples and pears of the mind. Neither historical nor causal analysis of the end-result of thought yields any test of its value. We have been solely interested in tracing particular ideas to their source. As there can be no thoughts without a thinker, thinking means a *person-thinking*. The form of thought, the sort of explanation, suggestion or hypothesis that comes to mind, the amount of effort exerted are characteristics of the thinker as an individual with a distinctive life-history, and every one of his thoughts must be understood in the context of his personal past. To select an isolated thought or action of

another person and interpret it in the light of our own values is like choosing an item of period furniture from a friend's house and setting it in the midst of our drawing-room furnished in ultra-modern style.³⁷ I close the chapter with a story recorded by Plutarch in his *Life of Alexander*. King Darius had offered Alexander ten thousand talents and certain territories as ransom for prisoners of war. Parmenio, the friend of Alexander, advised his master thus: "If I were Alexander, I would accept the offer," to which Alexander replied: "So would I if I were Parmenio," a reply which certainly deserved Longinus' description of it as something great and sublime.³⁸

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"The notion that, by setting groups of students to work at gathering, testing, measuring, and tabulating crude facts, relating, say, to infant mortality, expenditure on drink, or wages in women's industries, valuable truths of wide application will somehow be spontaneously generated, and that by a purely inductive process there will come to light general laws authoritative for social policy, is entirely destitute of foundation. The humblest grubber among 'facts' must approach them with some equipment of questions, hypotheses, and methods of classification, all of which imply the acceptance of principles derived from a wider field of thought" (J. A. Hobson, *Work and Wealth: A Human Valuation*, New York: Macmillan, 1916).

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Chapter 7

Contact of Minds

"WHO WOULD EXPECT originality from a committee or commission or board or that sort of thing?"¹ If the correct answer to this question is "No one," the implications might be serious. So let us see, therefore, whether the evidence justifies a negative answer.

During the last few decades there has been a huge increase in the number of bodies whose task it is to engage in collective or organised thinking. Growth in the sheer size and complexity of contemporary problems has shifted much of the control of public effort from individuals to groups. The number of committees in central and local government, industry, the professions and institutions of one kind or another must run into hundreds of thousands in this country alone. Consider the vast number of committees in the scientific world, associated with Research Councils and Institutes, learned societies, and Universities. These are often concerned with the tactical conduct of research as well as with strategically planning and directing it and deciding who should do what, when and where. If these committees were to be dissolved, would scientific activity be gravely hampered? or would there be a

feeling of great relief among scientists as if a dead hand had been lifted from the control of their affairs? Is the change from individual to group control conducive to greater effectiveness? Are the enormous number of hours spent at the committee table, frequently by men of high calibre, necessarily devoid of inventiveness? Are we to assume, with Schrödinger, that all this activity on the part of groups is totally lacking in originality and that, in the nature of things, groups are incapable of novel thought?

Groups and institutions vary in many ways which have a bearing on their capacity for original achievement, for instance, the manner in which they are set up. Some committees are self-generating. Others are appointed, and the choice of members will determine the character and degree of novelty of the outcome of the deliberations. If someone is chosen because he is said to be impartial, it may merely mean that he shares the prejudices of those who have selected him. Another way in which they vary is in the extent to which ideas are allowed to disseminate within them. In research laboratories, innovation is usually encouraged and information flows freely. In official departments, ideas seem to be transmitted down the hierarchy of authority, and anyone who suggests a new way of doing things may be looked at with suspicion. Organisations of this kind tend to perpetuate themselves by reshuffling their components. Rebel innovators are barred. If they appear, they are eventually neutralised in the administrative machine or ejected as foreign bodies. The birth of a new institution from such parent organisations is the outcome of procreation between closely in-bred minds, a kind of administrative incest. The resulting intellectual activity resembles an apostolic succession of ideas designed to preserve the existing state of affairs and masquerading as a system of social innovation.

Early studies of group thinking were mainly concerned with the attempt to assess the effects of group discussion on judgments previously made by individuals.² In the typical experi-

ment individuals are first given a task in which they have to arrive at certain judgments. Then they are formed into groups to discuss these individual judgments and arrive at a group judgment. A comparison is finally made between the accuracy of the individual and group judgments respectively. From these experiments a number of conclusions seem to follow. Groups in general yield a superior judgment because in a group there are more ways of considering a problem, more solutions are offered and each receives more criticism than when individuals work in isolation. We can therefore see why groups tend to give more accurate judgments than, in certain circumstances, individuals. The superiority of groups over individuals varies with the kind of task. It seems more marked when high performance depends on the addition of many contributions or on much interaction between the members. Small groups are superior to large ones when the material lends itself to immediate formation of opinion, and larger ones are better when it is desirable quickly to reject wrong proposals or solutions. There is a tendency in groups to avoid extreme views even when opinions are not uttered aloud. The amount of consensus of opinion in group discussion seems to diminish as the group increases in size from five to twelve members, and so does the influence of the chairman.

These experiments do not seem to have been particularly relevant to what most committees are actually called upon to do. A committee is not usually convened simply because its conclusions are likely to be more accurate than those that would be reached if each member were to meditate in isolation, or because it is expected to find the solution to clear-cut problems. The committee is primarily designed to provide an occasion for exchanging views between members. Superior accuracy or skill in problem-solving is not by itself an adequate test of group effectiveness. From this point of view, a rather narrow experimental study of committees is not the best approach. By itself it is unlikely to uncover the unconscious motive forces and personal interactions that influence a

committee in its work. For this purpose a clinical approach is needed in which the chief instruments are not seemingly sophisticated techniques but an understanding of social processes and an appreciation of the complexity of the patterns of human relationship. Mechanical "interaction recorders" popular at Harvard which treat the members of a committee as if they really were, and not merely appeared to be, robots are scarcely suitable for European committees.

More recently groups have been studied afresh as "systems of communication" in the sense that a post office engineer would use the term. This approach is also inadequate. A visitor from Mars (if his time were not taken up by other demands) would have very little idea of our social relationships if he limited himself to the study of networks of postal and telephone services without opening letters and tapping messages in order to learn something about the content communicated. In a committee, too, a person may send a message consciously intending one meaning and unconsciously another. The message may be received by other members ambivalently. One and the same remark may be understood in different senses by several listeners; and the manifest content of a message must be distinguished from its latent content, especially when we indulge in irony, and instead of saying what we think, pretend to think what we say.

Communication may be vocal, not merely verbal.³ In vocal as distinct from verbal communication, the intonation, emphasis, rate of speech, and mode of articulation affect the meaning conveyed. The more conventionally any statement is expressed, the less confident we can be of our interpretation of it. Communication may even be soundless. A person's silence may have one or more of several possible meanings. He may wish it to convey one meaning to some and another meaning to others present. Or he may wish to conceal his true meaning and camouflage it when he subsequently speaks. The frequency and distribution of silent intervals needs therefore to be watched. Silence is not a neutral background

against which the spoken word stands out. A prolonged silence on the part of a member may be an ominous sign, if it does not signify compliance. To withhold speech is often a common sign of hostility; one does not trust oneself to speak in case one explodes.

Communication may also be distorted by the way members perceive one another. One member may unconsciously attribute imaginary characteristics to another by seeing him not as he "is" but as possessing qualities or faults which the perceiver has previously associated with certain significant other people.

How can we judge the effectiveness of a committee or conference? There are two kinds of criteria, internal and external.⁴ Internal criteria require simply that some activity should have taken place. If the committee members feel happy after a meeting and pat one another on the back, they are satisfying internal criteria. But this is not enough. A captain of a ship who would be content with such standards would never know whether his ship was going forward or moving round in circles. In exactly the same way, without a link with the outside world the activity of a social group is likely to be "circular." The activity must be steered by reference to its effects on the world outside.⁵ This constitutes an external criterion of effectiveness.

The use of external criteria presupposes that committees and conferences, far from being closed systems, exist so as to bring about a change in the wider world of which they are part. The effectiveness of a conference of management and workers, for instance, might be assessed by noting the degree of improvement in subsequent industrial relations. Duration of stay of patients in hospital and their relapse rates are external criteria of medical and nursing effectiveness.⁶ The rate of recidivism is an external test of the effectiveness of detention in prisons. In general, if a social institution is to work effectively there must be a link between planner and executive and a "feedback" from the second to the first.

But external criteria at best can only help to maintain an equilibrium of ideas or action. If we look for originality in social thinking, we shall need other methods, those which give a positive feedback rather than a negative one. This means that obstacles to communication and receptivity must be minimised. Novel ideas are more likely to arise when participants are optimally receptive and responsive to continuously changing patterns of relationships in the context of the group. It must be emphasised that the human mind is essentially a social instrument, formed in close and intimate contact with other minds. So new ideas do not only come when we engage in lonely reflection. They may occur to us during conversation which initiates a train of thought of which we are unaware at the time and only fully appreciate later. Indeed, the capacity to integrate our perspectives with those of different individuals as well as the different aspects of our own personal experience is vital for the development of our intellectual powers. A reciprocity of perspectives then becomes possible, and we arrive at truth, in the Socratic sense, by mutual co-operation, by interrogation and reply. Truth is not a "ready-made thing."

The entire history of human thought is permeated by the method of discourse or disputation, a method which enables us to bring out fine nuances and reach reconciliation of differences.⁷ We find such a structure in the Platonic dialogues which represent "a transition to the full dramatic mode—that mode in which Shakespeare formulated the innumerable aspects of his own vision."⁸ The dramatic form is the most effective way for expressing incompatibilities and harmonies alike; it "gives opportunity for a number of sequences instead of one. . . . It serves to reveal the multifarious facets of reality." The mediaeval alchemist, fore-runner of the modern man of science, conceived of meditation as an inner dialogue in the Platonic tradition, for Plato defined thought as a dialogue of the soul with itself. Prof. J. B. S. Haldane somewhat unexpectedly seems to share the Platonic view, for he

describes thought and memory as communications of the self to the self.⁹

In order for such effects to take place it is essential to be able to *listen*, which means coming as close as possible to a speaker's understanding of what he himself means. It has never been more important than it is to-day to appreciate what *listening* signifies; the effectiveness of broadcasting, public speeches, conferences, debates, and teaching depends essentially on how people listen, and there is a difference between merely *hearing* and *listening*.

We could perhaps improve our receptivity to novel suggestions if we trained ourselves in the art of listening. This presupposes an alertness to our own tacit preconceptions, prejudices and stereotypes, an objective embodied in Geoffrey Pyke's principle:

Always look for what is good in a suggestion before saying what is wrong with it.

We may be helped to discover how new ideas arise in groups by considering the intellectual characteristics of scientific workers, acknowledged universally to have a high capacity for innovation. What distinguishes the scientific world from the political, administrative, industrial, judicial, military or religious worlds? We are again indebted to Geoffrey Pyke¹⁰ for pointing out several characteristic features of men of science. First, there is a tendency among them to publish newly-won knowledge as soon and as widely as possible. A large and diverse number of "signals" is thus scattered to fellow-workers. Second, scientific issues are continuously discussed in large numbers of informal groups, professional societies, and specialist journals, exposing the scientist to a flood of novel ideas. Third, discussion is absolutely free. Anyone can talk to anyone. What matters is not who you are but what you say. Fourth, the scientist is always looking for examples of situations where the usual way of doing or understanding things is inadequate. He challenges practices and assumptions

whatever their history or prestige, and however much sanctified by age or tradition. When he thinks he has discovered a shortcoming in someone else's work, he makes it a common experience, just as a medical officer reports to his fellow physicians a suspected case of infection. All concerned are then on their guard, and even if they are unwilling to accept the data or the interpretation or the inferences, their minds will have been prepared for receiving further observations of this kind. The alternative to such a procedure is that nothing will be changed until there is something like a crisis.

In England we are familiar with the fact that it is hard to introduce a change until a state of emergency compels us to. For example, a dangerous site in some places cannot be made safe for traffic until an accident has actually occurred. Often drastic changes must be made when the crisis is upon us. Such unwise practices would disappear if the scientific mode of thinking were more widely appreciated. Even a psychologist knows that it is hardly possible to make an intelligent decision in a moment of crisis, for a decision to take a particular course of action cannot be called intelligent unless other possible courses have been considered and evaluated; their relative merits having been judged, as far as possible, in advance of any crisis. If a decision is left to the critical moment, when the house is, so to speak, on fire, it is likely to be forced on us by the situation rather than the best one we should freely choose.

The quality of mind required of the man of science stands in contrast to that required of the military man as such. The scientist cultivates complete freedom of thought and expression. The soldier learns to take and give orders, and if he makes a mistake, he is likely to conceal it from those whose confidence he commands. If a scientist makes a mistake, he must do the very opposite. He must make the fullest and widest acknowledgment of his error. The virtue of the soldier, as Babbage¹¹ once said, is the vice of the scientist.

We turn now to factors which may hamper communication

between members of a group, such as members of a committee or participants in a conference. First of all there is the degree to which the members share the same professional or political outlook. If they are very homogeneous, they tend to occupy themselves with minutiae to which they attach a disproportionate importance. Tension from professional differences over trifles spreads to larger issues. By contrast a heterogeneous group is likely to ignore finer differences and to try to seek broad understanding of fundamentals. Homogeneous groups are therefore less stable than heterogeneous ones. Paradoxically those who are intellectually remote from one another reach agreement more easily than those whose views have much in common. A group of specialists will argue with passion, violence and bitterness over some point which to the outsider seems of little or no significance. Perhaps that is why, during World War II, meetings of an official committee of specialist psychologists and psychiatrists are said to have been described by a Lord President of the Council as resembling scenes in a "bear-garden." The politicians are no different. Socialism is politically nearer to Communism than to Toryism. Yet British Socialists are even more bitterly hostile to Communism than Conservatives, and Socialist leaders, for this reason, have been conspicuously less successful than the Conservatives in their efforts to come to terms with the Communist regimes.

A second hampering factor is the degree to which the participants are prepared to receive new ideas. Clearly we must take account of the fact that delegates to committees and conferences are often sent to plead for special interests and consequently are given rigid instructions beforehand. So their minds tend to remain closed to any suggestions not contemplated by the policy-makers behind them. In any case, in England at any rate, one must endeavour at all costs to avoid creating any precedents, an aspiration successfully realised by the leader of a national British delegation to a Unesco General Conference. At the outset, the leader

"urged the Conference when it considered new proposals not to be afraid to say 'no' merely because no good reason could be urged against them."¹²

This neophobia may be illustrated by the following incident at one of our institutions of higher learning. A discussion took place on ways and means of paying for printing the Annual Report of a Society. One member suggested that advertisements should be included to help defray the cost, a suggestion which was rejected on two grounds. The Chairman said that it had been considered at previous meetings but turned down because advertising was "not done" in Annual Reports. The Hon. Treasurer added that there was no precedent for such a practice. What had never been done before could not be done now. No one in the audience thought fit to question the soundness of the decision reached on such grounds.

A third influence which may impoverish the work of a group is a stereotyped notion of the supposed role of members. The following example illustrates how this can happen. A committee which had completed its work and was about to disperse received a request from a higher authority to submit further recommendations on a certain subject. This request came as a complete surprise to all the members except one who had known all along of the committee's obligations to submit recommendations to the particular authority. Had the awareness of this obligation been general, members would certainly have devised ways of fulfilling it. At the eleventh hour it was too late to prepare any useful material. When the one who had known was asked: "Why did you not tell us before?" the reply came, perhaps half in jest, "No one asked me." The belief that it is possible to defend negligence with the plea that one had not been asked had serious consequences. If the social climate had been such that the excuse "No one asked me" would be unthinkable and unacceptable in any circumstances, a situation like this could never have arisen.

A more dramatic example of the way a member's unquestioned conception of his role can lead to disastrous consequences is one for which we are once more indebted to the perspicacity of Geoffrey Pyke. He came across it in a study he made of the Report of the Royal Commission on the Dardanelles. The question at the time was whether the Dardanelles could be forced by the use of sea power alone. Now a number of experts who were principally concerned were strongly opposed to a naval attack unaided by land forces. But they never said so, and if any one of them did express an opinion, it was at the wrong time. So their views never became known to the Ministers responsible for the decisions. Why did the experts not reveal what they thought? Duty, or at least what they believed was their duty. No one ever discussed what "Duty" was. As a subject of discussion, it was taboo. "It was better not to talk about it and, if possible, not to think about it. They succeeded in not thinking about it." The First Sea Lord believed that it was his duty to withhold his views until he could not suppress them any longer and then resign. He and his colleagues conceived their basic duty to be not to enquire into what "Duty" was. Just as they did not expect their subordinates to give advice unless they asked them for it, so they themselves did not offer advice until they were asked. In the words of the First Sea Lord: "We were the experts who were to open our mouths when told to."

A fourth and perhaps more pervasive cause of intellectual ineffectiveness in committees appears to be the tacit assumption implied in the behaviour of the participants that agreement between them is desirable as an end in itself. This is clearly to rely on an internal criterion of effectiveness. To a greater or less extent, varying with circumstances and the individuals involved, members' attention is turned from points on which they diverge to matters on which they think alike. They are thus led away from exploring differences, which is the primary task, to discussing measures of agreement. This reveals a tendency on the part of individual members to con-

form to the group and yield to its pressures, a *compulsion to agree*. The social consciousness of the participants shrinks to keep out whatever is nonconforming and anxiety-provoking. Free and uninhibited expression is discouraged. In fact, the nearer the group moves towards a decision, the more any divergence on the part of a member threatens its solidarity. The compulsion to agree grows stronger as the moment of decision approaches.

Even that august body, the Royal Society, has, at least in bygone days, been affected by a *compulsion to agree*. "The reluctance to oppose that which is disapproved," wrote Charles Babbage,¹³ "has been too extensively and too fatally prevalent for the interests of the Royal Society . . . some portion of it is due to that improper deference which was long paid to every dictum of the President and much of it to that natural indisposition to take trouble on any point in which a man's own interest is not immediately concerned."

Actually, in the early stages of modern science violent polemics seem to have been the rule, but they do not appear to have obstructed its development.¹⁴ The discovery of sympathin and the operation of complete sympathectomy were the direct consequences of a polemic.¹⁵ In the work of public bodies like Royal Commissions, as exemplified by the Webbs' Minority Report on the Poor Law, intellectual divergence from the group in the long run proved far the more fruitful and socially effective course to take.¹⁶

Preoccupation with agreement makes it difficult to listen and to understand what others are saying. Members agree or disagree with what is not properly understood. I do not mean that no differences of view are expressed or that stormy meetings are unknown, but that differences of viewpoint are expressed with considerable and undue restraint. When an attempt is made to utter a divergent opinion, the effort is usually abandoned in the end. The less voluble or less dominant members surrender. So the group's capacity to tolerate differences without disintegrating becomes reduced. A com-

pulsion to *disagree* also occurs, but it seems to be much more rare. The crucial point is this: for group discussion to be intellectually more fruitful than private meditation, each member must be as free to utter aloud in the presence of the group what he would think to himself privately. If this condition is satisfied, there are possibilities of a very great enrichment of the collective effort. But any compulsion to agree destroys the essential freedom of utterance.

Judged by external criteria of effectiveness, there is no merit in agreement as such. Indeed, it may sometimes merely be a device for preserving an illusory omniscience. "I agree with you" may be a formula which means "You must be right, because I think so too." If agreement is a substitute for the exploration of differences, it reduces the possibility of interaction among members. The exchanges on which group thinking depends cannot take place when all participants tend to think alike. In point of fact, two individuals or groups may really be co-operating more when they are in opposition than when they are content with superficial agreement.¹⁷

A compulsion to agree can be shown to occur even in experimental situations. An individual is placed in a relation of conflict with most or all the members of an experimental group and the effects on his judgment are then recorded. The members are asked to match the length of a given line with one of three unequal lines, one of which, to a naïve observer, is clearly similar in length to the given line. One member finds himself contradicted by the rest, who are told by the experimenter¹⁸ beforehand to give false judgments. The effect of the majority in compelling agreement on the part of the individual who finds himself in a minority may be measured by the frequency with which he accepts the majority view. In such experiments, about a third of the individuals who found themselves in the minority agreed with the majority. Afterwards they confessed to having "experienced a powerful impulse not to appear different from the majority." A unanimous majority of three was found to be more compelling than a

majority of seven and one dissenter. The compulsion to agree seems to diminish when there is some support for divergence.

The tendency to substitute agreement for understanding is due to culture, not to any hereditary influence. It is fostered, no doubt, in rearing and educational practices. To the extent that a child rarely has the experience of being understood and feels he is being controlled by someone else, to that extent he will seek agreement rather than understanding. Trying to understand another is the counterpart of being understood.

Can anything be done to improve an adult's capacity for understanding in place of a mere insistence on agreement? Consider the following examples: When a Tory member gets up in the House of Commons and begins to make a speech, we often know in advance the tenor at least of what he is going to say, and we could sometimes finish his speech for him. We know that he is perfectly familiar with his party's policy and there is no need for him to demonstrate this fact whenever the opportunity presents itself. What we do not know is whether he has grasped the viewpoint of the Labour Party. Exactly the same applies to a member of the Labour Party when his turn comes to speak. In a court of justice, too, we know full well that counsel for the prosecution can state his *own* case, just as counsel for the defence can state *his*. What we do not know is whether they have a full and proper understanding of their opponent's viewpoint.

A remedy may be suggested for this situation.¹⁹ Let no one be allowed to state his own case or to criticise his opponent until he has satisfied him and the others present that he has grasped his point of view. This rule would have to be accepted by those concerned as a fundamental principle of procedure. Suppose now a dispute has started. When either party to the dispute hears his view presented by his opponent, he may begin to see it in a new light, more objectively, and more as others see it. To hear his own view put in a rather different form and in different words may lead him to revalue his own ideas. He may begin to see some point in his op-

ponent's objections. And in trying to expound the view of his opponent, he may find himself in difficulties. He may discover that he has been objecting to something that he has not fully understood or even misunderstood. He will find it hard to insist on his objections so long as the other members present can see that he has not grasped the view which he rejects. This may have a salutary effect on him. He will now feel impelled to make a genuine effort to understand the other view, for otherwise he will not succeed in expounding it satisfactorily. His very effort to understand will affect the nature and tone of his criticism. He may begin to see his opponent's view in a new light, and possibly even to identify himself a little with it. *The effort to understand is the beginning of reconciliation.*

The procedure is likely to have a similar effect on those members present who are not parties to the disagreement. They will hear a point of view expounded by someone who agrees and by someone who disagrees with it. They may begin to learn the desirability of understanding another's views before objecting to them. So they will come to make greater efforts to understand before venturing to criticise, and they will be quicker to realise the futility of criticising something not understood. The effort to present another's point of view to *his* satisfaction at the same time necessarily leads to an examination of differences. This same effort, which begins as a means to an end, has a chance of becoming an end in itself. The attempt to present an opponent's position in order to satisfy impartial listeners may acquire an autonomy of its own.

Hence the importance of what Gasset has called "perspectivism" in social and political life. "Truth" from a single perspective only is a provincialism. For a provincial is a person who thinks that *his* point of view is the only correct one. One and the same political group may be regarded as belonging to the extreme *right* by those on the left and on the extreme *left* by those on the right. Just as, with a camera, we can take a photograph of a house from any one of an infinite number

of different angles, each photograph giving only one of the possible perspectives, so one political view is only one facet of political "truth." An ensemble of different perspectives constitutes social "truth." The procedure of "role exchange" or "role reversal," which I have outlined, stands in stark contrast to the methods of "thought reform" to compel agreement employed, for instance, in contemporary China.²⁰

"The very seeing of another vista," as Nietzsche²¹ wrote, "the very *wishing* to see another vista, is no little training and preparation of the intellect for its eternal "Objectivity"—objectivity being understood not as 'contemplation without interest' (for that is inconceivable and nonsensical), but as the ability to have the pros and cons *in one's power* and to switch them on and off, so as to get to know how to utilise, for the advancement of knowledge, the *difference* in the perspective and in the emotional interpretations. . . . There is only a seeing from a perspective, only a 'knowing' from a perspective, and the *more* emotions we express over a thing, the more complete will be our 'idea' of that thing, our 'objectivity.'"

Let us now return to our original question. Too little is known of the nature of social interaction to dismiss, as Schrödinger does, the possibility that groups possess a potential capacity for original thought. There are certainly no *a priori* grounds for despising the group as a vehicle of innovation. On the contrary, the presence of a group, provided there is freedom from inhibition and optimal receptivity, offers opportunities of assimilating the thoughts of others and of accommodating to them which cannot exist when a person is alone. In certain respects, then, the possibilities of original thought are greater in the context of such a group than in individual thought, which itself cannot dispense with "invisible" groups.

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PART FIVE

Chapter 8

Work and Play

WORK IS the very theme and substance of life. Throughout the ages thinkers have been puzzled by its nature and purpose. Their views have helped to shape our social heritage which we tend to take for granted. Conceptions of work which have been handed down from generation to generation are embodied in our social institutions, laws, industrial organisation and educational practices, in the conditions under which we work and in the kind of rewards we receive for it. We assimilate these cultural elements from our earliest years onwards and our responses to them are modified in the course of our individual lives. An understanding of the place of work in personal and social life presupposes a knowledge of the raw material of this tradition and of the main influences in the individual's life-history. In what follows I shall attempt to trace the history of the idea of work in the Western world singling out those aspects which bear on the contemporary situation.

The study of work and units of work in the modern industrial sense began a century ago.¹ Before then, the idea of work had another meaning. In the Newtonian system, "work"

was only of interest to astronomers and it was expressed mathematically as the product of celestial distance and celestial force. *Physiological* "work" in terms of the energy transformations of the human body was first measured by Lavoisier on his collaborator Séguin in 1777.² The industrial conception of "work," as a basic measure of mechanical action, developed during the nineteenth century as "something" that determined the output of factories and mines. This conception was indispensable for the development of trade and commerce. Whilst the notion of astronomical "work" done by planets when falling through a certain distance was sufficient for an age of navigation, an age of industrial enterprise needed the "work" of pumps and internal combustion engines.

In time the realisation that the efficiency of water pumps and other mechanical devices could be measured led to the idea that the efficiency of the human operator of the pumps could also be measured, and comparisons began to be drawn between the activity of man-made machines and human effort in terms of the ratio of "work" done to energy generated. Thus an average athlete when running his fastest requires the chemical equivalent of about thirteen horse-power.³ Less than a quarter of this is usefully consumed, the rest being wasted, which represents a mechanical efficiency of, say, 25 per cent as compared with 10 to 30 per cent in a steam engine and 30 to 40 per cent in a Diesel engine.⁴

So long as this is not intended to refer to more than physiological activity no harm is done. The situation is different when empty analogies are drawn between physical and mental work. For instance, we find "mental work" sometimes defined as the product of difficulty, amount and quality over time:

$$\left(\frac{\text{Difficulty} \times \text{Amount} \times \text{Quality}}{\text{Time}} \right)$$

Since physical work is defined as mass by distance over time, difficulty in the above formula is supposed to correspond to *mass*, amount to *distance*, with quality added to allow for the

human element. This "operational" formula for mental work may be of some interest for describing anaemic artefacts of the psychological laboratory. Its usefulness ends there. The same applies to the impressively elaborate attempts to measure so-called "human performance" which take no account of the operator as a person, as a member of society in general or of a given epoch in particular. Such investigations assume that it is possible to study human work as if neither history nor society mattered at all, as if, indeed, the operator were not a human being. They admit of no distinction between the activity of a human being and that of a machine. They leave out of account the subjective side of work, its phenomenology, its social history, its history in the life of the person, its relation to play, and its variation from culture to culture. A merely physical or physiological definition of human work omits to consider those distinctive aspects which are not shared either with the activity of machines or with that of animals. Little wonder that research guided by such definitions has little bearing on what people do in factory, field or office.

In contemporary psychology "work" has now become synonymous with "activity," and the word "work" itself is said to denote "any overt motor performance, regardless of its vocational or recreational significance."⁵ The word has been robbed of its human meaning, which has been replaced by an exclusively physical reference, as in the statement that "work, strictly speaking, is a physical term signifying transformation of energy."⁶ Any other use of the word is regarded as an unjustifiably loose use of a "technical" term.⁷

Of course, people worked thousands of years before the word "work" was defined in the language of physics and physiology. This word, like many another word with a human meaning, has been surreptitiously appropriated by the physicists and physiologists, leaving it devoid of human content. A similar fate has overtaken words denoting sense perceptions, which have no place in the physical study of optics, acoustics and heat, sound and colour being defined by the frequency and wave-length of oscillations and temperature by an abso-

lute temperature scale.⁸ I have no wish to plead for the recovery of such words nor to argue that the definition of "work" given by the physiologist or physicist serves no useful purpose. What I wish to assert is that this new meaning blots out what the word originally meant. The result is to neglect the personal, social, cultural and historical significance of work in favour of physical or physiological activity.

Turning from the study of work to the fundamental values placed upon it we find, in the history of the Western civilisation, two contrasting values: work as a curse and work as a blessing. These two conceptions, which have their own history, are embodied respectively in the texts: "In the sweat of thy brow shalt thou eat bread" (*Genesis*, iii, 19) and "For thou shalt eat the labour of thine hands, happy shalt thou be, and it shall be well with thee" (*Psalms*, cxxviii, 2). The idea of work as curse and sorrow is also to be found in ancient Greece, in Homer, Xenophon and Hesiod. Very much later, in Virgil's *Georgics*, we find work represented as bringing advantage to man by leading to the invention of the arts. The value placed on work varied from one Greek city culture to another. In his *Life of Lycurgus*, Plutarch tells us that in Athens a man would be fined for idleness, whilst in contemporary Sparta his idleness would be a sign that he was keeping up his dignity. Strictly speaking, as J.-P. Vernant⁹ has pointed out, classical Greek has no single word corresponding to our "work" (*travail*, *Arbeit*). The Greek word *ponos* is applied to all activities demanding a painful effort, not only to productive tasks which are socially useful. It has the same root as the Latin *poena* (punishment, penalty, pain).

The idea of work as a curse enters into the beliefs of primitive peoples. The Ashanti, for example, believe the spider is the Creator who forbade cohabitation. To punish human beings for violating his order, he commanded men to work and decreed that women must endure pains at childbirth. The Luba believe that the gods punished men with toil and death for eating forbidden bananas.¹⁰

The bifurcation of the idea of work into curse and blessing respectively is perpetuated in the divergent values found in Patristic and Talmudic writings. A fusion of the two appeared sporadically, for example in the work of Philo of Alexandria (20 B.C.—A.D. 54), whose syncretist tendencies led him to speak of work as at least partly though not intrinsically good. Work, he believed, was imposed by the Fall; nevertheless it remains the source of all virtues because it can bring us back to the good.¹¹

The problem of work loomed large in the writings of the early Fathers. They speculated freely on the kind of life led by Adam before the Fall, a question which fascinated them more than anything else. They were intrigued by this problem not because of its fantastically unreal nature but because the answer to it yields the key to the ideal society. How would *we* spend our time if we lived in the perfect society? According to St. Augustine, the fact that Adam did not actually spend his days toiling in the Garden of Eden does not mean that he lived an idle life of leisure. He devoted himself to gardening, the "agreeable occupation of agriculture," which provided the opportunity for constant communion with nature.¹² St. Augustine certainly believed that work was good, and his famous *De Opere Monachorum* was an outspoken attack on monks who refused to work. He castigated their specious pretexts in no uncertain terms.¹³ By contrast, Abelard, six hundred years later, rejected this view and taught that agriculture, far from being practised by Adam before his expulsion, was imposed on him as a penance for the Fall.¹⁴

Until the time of St. Thomas Aquinas many religious sects clung to the belief that work is painful and humiliating, a scourge to the flesh.¹⁵ This belief is toned down in the writings of St. Thomas, who nevertheless regarded work as a duty, a "necessity of nature." In his hierarchical scheme agriculture ranked first, handicrafts second and commerce third. But, if one prays, there is no obligation to work, for

ecclesiastical activity is above any manual labour, and prayer is at least the moral equivalent of work. In no circumstances was a person to use his work to pass from one social condition to another. Social mobility was ruled out, for the social order was not man-made. It was divinely ordained.

Luther reintroduced a harsher note, though without any radical change of principle. He firmly believed in the spiritualising power of the "sweat of the brow." Like St. Thomas, he ranked the agricultural worker highest in moral worth, the craftsman next and the trader last, and for him, Luther, idleness and covetousness were unforgivable sins. As Zwingli declared, "In the things of this life, the labourer is most like God."¹⁶ All men must serve God through the medium of their daily occupation. All vagrants must be put to work, and monasticism must not be allowed to let them evade the obligation of work.

It was Calvin (1509-1564) who, in the light of his age, reinterpreted the conception of work as a curse and thereby set the stage for the place of work in modern life. Calvin went much further than his predecessors in "theologising" work. Where feudalism, in the sense of an immutable social order, comes to an end, there Calvinism begins.¹⁷ Everyone even the man of wealth, must work; such is the divine will. Everything secular must be devoted to the glory of God. There are to be no rigid or sacred social castes. On the contrary, it is the duty of everyone to display the utmost initiative in seeking an occupation which can bring himself and society the greatest reward. Restrictions to investment must be removed. Henceforth the hoarding of wealth must be replaced by investment and re-investment; for work, duly spiritualised, is the means to a divinely given end. The cult for work begins. At the same time all pleasure for its own sake must be rooted out. As the Quakers later taught, the flowers of pleasure may only be plucked in the fields of duty. In Puritan morality, work is an ascetic discipline. This doctrine eventually found characteristic expression in Tolstoy

who held that work is as much a necessity as food, that only manual work is worthy of man, and that every man should produce his own bread.

First signs of a revulsion from the idea of work as a curse are to be found in the *Utopias*. Both in the *Utopia* of Sir Thomas More (1478–1535) and in the *City of the Sun* of Tommaso Campanella (1568–1639), a Dominican monk, work has become humanised. Everyone works, and his occupation is congenial. Nobody works more than four hours a day. After work ends, one may play or study at will. The glorification of work is also to be found in the writing of Leon Battista Alberti (1404–1472), an Italian architect; Marsilio Ficino (1433–1499), a humanist; and above all in Giordano Bruno (1550–1600), who first embraced Calvinism and later quarrelled with its originator.

In Rousseau, a century and a half later, we meet a complete change of outlook which indirectly led to a revaluation of work from curse to blessing. Rousseau idealised the child and saw greater worth in the spontaneous play of the child than in the forced labour of the adult. This view, without its emphasis on what was natural to man, was developed by Schiller,¹⁸ who declared that the true significance of the child's play is in its likeness to the art of the adult. "Man only plays when in the full meaning of the word he is a man, and he is only completely a man when he plays." With such a conception of play the Calvinistic notion of work was utterly incompatible. Schiller's theory of play differs from that of Spencer and Darwin. His is idealistic. Theirs is biological. To Schiller human play expresses freedom, not raw nature. Far from being equally characteristic of animals and men, it is distinctive of man. It is specifically human.¹⁹ In this turning from work to play we are reminded that Plato wished to see the state legislate for the compulsory teaching of play. In the seventh book of the *Laws* he claims that the play of childhood affects the permanence of all forms of statecraft. In the *Republic* (Book IV) he wants children to take part

in lawful games so as to grow up in an atmosphere of "virtuous citizens." Aristotle also spoke of the recreative value of play.

From here it is but a short step to devalue the moral discipline of work. In Schiller work and play are still two worlds, one a world of burdensome impositions; the other, of freedom and spontaneity. In Ruskin these two worlds become one. The spontaneity and art of play are to be sought in work itself. The humanisation of work begins. This changed conception is explicit in Ruskin and, through his influence, in William Morris and more recently in Hobson and Delisle Burns. Ruskin profoundly believed that man can rejoice in his work and that art is the expression of this joy. He was convinced that "unless man's work again becomes a pleasure to him the token of which will be that beauty is once again a natural and necessary accompaniment of productive labour, all but the worthless must toil in pain, and therefore live in pain."²⁰ When I read Ruskin I am reminded of the Venetian shoe-cleaner in the Piazza San Marco who pursues his craft with all the artistry, care and devotion of a great painter. He seats his client on a throne alongside which is arrayed a splendid array of materials, colours, oils and chemicals, boxes, tubes, bottles, brushes, and cloths. A spell-bound crowd gathers to watch the artist at work, but he is oblivious of his admirers, so absorbed is he in his labour of love. The operation, so perfunctorily performed by his Philistine counterparts in other countries, may last an entire afternoon. "There is no craft so humble," wrote Wyndham Lewis,²¹ "but the craftsman derives a certain satisfaction in knowing that there is no man alive (not of his craft) who can do what he can do, whether it be a piece of fine cabinet-making or the growing in a hot-house of a rare plant." To the Victorian worker, however, in factory, mill, or mine, work was something which no-one really wanted to do but which *had* to be done. For him work remained a curse. Whatever value it had, whatever dignity or prestige, came

from its aim, which was extrinsic to the task; work lacked an intrinsic vitality of its own. Hence that is why work was imposed in prisons as a punishment for crime. The twin notion of play as a mental waste-matter and frivolous dissipation of time deprived leisure of any value of its own.

A step beyond Ruskin was taken by Bergson, in redefining *homo sapiens* as *homo faber*; human intelligence is by its very nature a capacity for inventing and using tools, a means of creating forms of action. But the nineteenth century in England ran its course untouched by the idealism of Rousseau and Ruskin. This idealism made sense only to those whose work was freely chosen. To such people, work, like play, is lavish and prodigal. It is not restrained, restricted and calculated with an eye to reward. It is unstinted. For them work is, in fact, play, and they exert in their labours a superabundance of effort. Some few have always existed who have refused to see in their work an imposition to be carried out for an ulterior goal. Even those who have taught that work is a spiritual discipline have engaged in their own tasks in a spirit resembling that which enters into play. Wisdom is like play, said St. Thomas, for both are pursued for their own sakes. "Scientific and artistic creation, political and moral heroism, religious sanctity, are the sublime results of 'sporting efforts.'" ²² Even God is conceived as engaging in play. "For in forming this (the spherical surface)," said Kepler, "the most wise creator created playfully the image of His venerable Trinity." Elsewhere he wrote:

"Now as the creator played, so He also taught Nature, as His Image, to play; and to play the very same game that He played for her first . . ." ²³

The Psalmist, long before Kepler, had also written "There is that leviathan whom thou hast made to play therein" (*Psalms*, civ, 26).

Nevertheless in a number of countries, including Britain, there has been a change in the comparative valuation of

work and play, together with a shift of emphasis from production to consumption. In place of the notion that play is a frittering of time that could better be devoted to work, it has come to be valued as an end in itself, whether it is organised or spontaneous. This alteration has been accompanied by a diminution in the seriousness of work. Where formerly the end gave value to the means and a task was assessed by its result, now the spontaneity of the effort gives dignity to the outcome.

A clear transformation of work morality into a morality of fun appears to have taken place in the United States, as may be judged by the change during the past forty years in the content of the periodical *Infant Care* published by the U.S. Department of Labour.²⁴ In 1914 the American infant was believed to be moved by powerfully dangerous impulses leading to such vices as thumb-sucking and masturbation. These impulses could easily get out of control and the child would then be ruined for life. The American mother was exhorted to wage a relentless battle against the sinful nature of her child; mechanical restraints against masturbation, tying the infant's feet to the opposite sides of the crib, pinning down the sleeves of his nightgown, or employing a hard cuff which keeps the elbow stiff. In more recent numbers of *Infant Care*, the baby has become harmless, innocent and merely exploratory. His impulsive life is now a diffuse and healthy muscular activity. His play is not debilitating. It is invigorating, and instead of being wicked, it is a duty. The guilt of fun is replaced by guilt for not having enough fun. Fun is obligatory. The boundary between work and play is blurred.

In Western countries generally, however, the serious element in life still consists in *obtaining* opportunities and the frivolous element in *using* them. Work is still considered the main task, and there would be almost as much objection to the frivolous treatment of work as to the serious treatment of leisure.²⁵

We can now see the contemporary spiv²⁶ in historical perspective as a natural son of Calvinism. Spivery is a revolt against the imposition of meaningless work, a repudiation of work as a curse by those who are no longer terrified by curses from above. Spivery induces neither a feeling of necessity to work nor a spontaneous activity to take its place. It is a debased play devoid of obligation or freedom, and sustained by the spectacle of "conspicuous consumption" by those who have no need to work. The result is a universal spivery, which has infected the entire culture, with its major industry of gambling, horse- and dog-racing, football pools, etc. If two-thirds of the working population spend a goodly proportion of their leisure filling in coupons for football pools, this can only be the result of a desire not to work. The publicity given to the lucky winner of a large fortune merely whets the appetites of the hordes of less fortunate coupon-fillers.

Earlier in this chapter I spoke of the meaning of work to a person. When this meaning becomes particularly intense it may acquire a sexual signifi- cance and consequently be represented in symbolic form. Freud was of the opinion that "concentration of the attention upon an intellectual task and intellectual strain in general produce a concomitant sexual excitation in young people as well as adults."²⁷ He suggested that the organism may have certain contrivances for invoking sexual excitation as an accompanying effect when other processes reach a certain level of excitement. "It may well be that nothing of importance can occur in the organism without contributing some component to the excitement of the sexual instinct."²⁸ This view is supported by the fact that many authors who have described their experiences whilst writing are apt to use symbolism with a marked erotic flavour, which is not surprising because authorship is among the most absorbing of occupations.

A number of descriptions quoted by R. E. M. Harding²⁹ in another context are open to the interpretation that the act of

writing has acquired a sexual symbolism. Southey wrote: "I never enter into any regular train of thought unless the pen be in my hand; they then flow as fast as did the water from the rock in Horeb, but without that wand that source is dry!"³⁰ Galsworthy would sit pen in hand hoping that this expectant attitude would induce his thoughts to flow."³¹ Milton is perhaps more equivocal. He "had commonly a good stock of Verses ready against his Amanuensis came; which if it happened to bee later than ordinary, hee would complain, saying hee wanted to bee milk'd."³²

Madame de Staël found that when she took up her pen, her brain "seemed to become uncontrollable,"³³ and Mrs. Hathaway wrote the following account of her creative mood:

"I felt a vibration like music all through me as if my blood were actually singing. And as though I were driven by that music which was formless yet felt as if it had the force of a dynamo, I crouched over my pad and held my pencil slavishly quick and intense, ready to serve this marvellous buzzing happiness at the moment when like surcharged atmosphere it would condense and form previous words that would drop on to my paper from the end of my pencil. I was not conscious of my buzzing until after the rapture left me. Then I heard the tail end of it, like the merry-go-round breaking down, and I thought, for a split second, how queer it was."³⁴

All these descriptions are outdone by Nietzsche's famous passage in *Ecce Homo* in which he reveals his own experiences while in the throes of writing.

There is linguistic evidence of a psychological association between erotic satisfaction on the one hand, and work and play on the other. In sexual experience itself there is a continuum between play and work. The expression "foreplay" suggests playful preliminaries before, as it were, getting down to work.³⁵ "Germanic languages abound in erotic applications of the word 'play.'"³⁶ For example, there is the double

meaning of the word *Spielkind*. Similar connotations are to be found in Chinese. In the Bible, too, the Hebrew words for "play" (*Genesis*, xxvi, 8) and "work" (*Genesis*, xxxix, 11) have been interpreted in an erotic sense, and we may recall here Freud's remark that the Greek god Eros symbolised both play and love. Furthermore, the words *labour* and *travail* are linked with childbirth, and the Greek *techne* (manual skill) is connected with *tikto* (to bring forth) and also, apparently, with the root *tek* (= to cut or castrate).³⁷

This leads us to make a brief reference to psychopathological disturbances which may affect work. Very little attention has so far been given to the ways in which work may be disturbed because of emotional upheavals in the life of the worker. It is a commonplace that any group of workers may vary considerably in the amount of effort they exert, in relation to the amount of effort of which they are capable. Some of these variations are outside the individual's control. They may make him exert too little or more frequently, as in the obsessive, too much effort. For the obsessive tends to regard every action as an emergency or crisis and undertakes it with immense drive.³⁸ For similar reasons he often has great difficulty in taking action or arriving at a decision affecting other people. Because he tends to be a perfectionist he will delay and procrastinate. Occasionally an obsessive is encountered who needs to be "kept," as in the case of the patient who suffered from every known emotional disability but who retained his capacity for work so long as he received no payment for it.³⁹ Unfortunately, such men are rare.

There is a further aspect of work to which we must draw attention, the developmental aspect. Is it possible to identify different experiences in the early years which may form the prototype of adult work? In reply to this question, the suggestion has been made⁴⁰ that the effort required in work is first made by the infant sucking at the breast, when he begins to learn how to co-ordinate his muscular exertions. Naturally this early effort does not carry with it the same meaning as

work does for an adult. Nor can the infant distinguish between play and work. As yet there is no dividing line between pleasurable and pleasureless effort. The feeling of carrying out an obligatory task is instilled during toilet training when the infant is under pressure to obey his mother's wish. He has to persist until he produces something worth while and at the same time avoid "making a mess." This experience initiates a new phase in which the effort exerted has an ulterior aim. It is distinctive in that pleasure is deferred and waiting may bring discomfort.

In drawing this chapter to a close we must conclude that "work," in the sense of discharging an obligatory task for an end external to the task itself, is not an "instinctive" characteristic of the human species. In this sense work is a cultural rather than a biological phenomenon. Otherwise we should be at a loss to account for those who live parasitically on the labour of other people. And we must distinguish between the deliberate work of human beings and so-called animal "work" like nest-building.⁴¹ It only leads to confusion to class the two kinds of activity together. Animal "work" is strictly innate, due to "built-in" mechanisms and leaves the animal no choice. Human work is, in principle, subject to choice. And where the choice is open, many prefer to exercise it in favour of not working. There are communities where men are unwilling to work more than is absolutely necessary for subsistence. In 1802 the Governor of Ceylon, in a despatch to the Secretary of State, wrote "There is not an inhabitant in this island that would not sit down and starve out the year under the shade of two or three coconut trees rather than increase his income and his comforts by his manual labour."⁴² Indeed, Freud went so far as to assert the vast majority of people, far from being eager to work, wish to remain children and play instead of work.

In this chapter I have put forward the view that the attempt to study human work as if it were indistinguishable from the activity of animals or machines is misguided. By

devoting exclusive attention to measurable physiological aspects it ignores the most distinctive features of human work. So-called operational definitions of "mental" work are open to a similar objection. There is a legitimate study of physical and physiological aspects of human activity, but not at the expense of the study of work in its personal, social, cultural and historical aspects, which alone give meaning to work. If we wish to understand the valuations of work embodied in our institutions, and in our legal, educational, industrial and social practices, we shall not succeed if we confine our interests to the worker's metabolism or to artefacts the sole merit of which is that they can be counted. In order to make sense of variations in work from epoch to epoch, from culture to culture, from class to class, and from person to person, we must take an historical and comparative view as well as appreciate the ontogenesis and psychopathology of work.

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5. R. H. Seashore, "Work and Motor Performance," in S. S. Stevens (editor), *Handbook of Experimental Psychology*, New York: Wiley, 1951, p. 1341.
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7. Since this chapter was written, I have had the opportunity of reading a valuable article by Monsieur I. Meyerson ("Le Travail, Fonction Psychologique," in *Le Travail, Les Métiers, L'Emploi*, Paris: Presses Universitaires de France, 1955) which I am glad to find is in close accord with my own views. Monsieur Meyerson's article and those of his collaborators, in the volume referred to, may be warmly recommended to those interested in pursuing the topic.

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9. J.-P. Vernant, "Travail et Nature dans la Grèce ancienne," *Le Travail, Les Métiers, L'Emploi*, I. Meyerson (editor), Paris: Presses Universitaires de France, 1955, pp. 18-38.

10. H. Kelsen, *Society and Nature*, London: Routledge & Kegan Paul, 1946, p. 167. See also A. J. Jaffe and C. D. Stewart, *Manpower Resources and Utilization*, New York: Wiley, 1951, chapter 18.

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23. Quoted by Pauli, *op. cit.*, pp. 168-172, from *Ad Vitellionem paralipomena* and *De Signaturis Rerum*.

24. M. Wolfenstein, "The Emergence of Fun Morality," *J. Social Issues*, 1951, 7, 15-25.

25. C. Delisle Burns, *Modern Civilization on Trial*, London: Allen and Unwin, 1931.

26. The word "spiv" is used in England to denote a person who is conspicuously successful in consuming without producing. Here is a vivid picture of the spiv of a generation ago: "When we dip down below the bourgeois and the regular working-classes . . . we find a lower leisure class whose valuations and ways of living form a most instructive parody of the upper leisure class. But in country and town life these types appear. They include 'gypsies,' tramps, poachers, and other vagabonds, who have never been enlisted in the army of industry, or have deserted in favour of a 'free' life of hazard, beggary and plunder. In towns natural proclivities or misfortune account for considerable groups of casual workers, professional or amateur thieves and prostitutes, street-sellers, corner-men, kept husbands, and other parasites who are a burden on the working-classes. Alike in country and in town, these men practise, so far as circumstances allow, the same habits and exhibit the same character as the leisure class at the top. The fighting, sporting, roving, generous, reckless, wasteful traits are all discernible, the same unaffected contempt for the worker, the same class camaraderie, often with a special code of honour, the same sex license and joviality of manners. Even their intelligence and humour, their very modes of speech are the half-imitative, half-original replica of the high life as it shows in the race-course, in the club smoke-room, or the flash music-hall." (J. A. Hobson, *Work and Wealth*, New York: Macmillan, 1916, pp. 155-156.)

27. S. Freud, *Three Essays on the Theory of Sexuality*, translated by J. Strachey, London: Imago Publ. Co., 1949, 4th ed., p. 82.

28. Freud, *loc. cit.* The reactions of a boy described by Ischlondsky illustrate this phenomenon. "If, when taking a written test in mathematics, the boy did not succeed in solving the problem soon enough, and had only a few minutes left for formulating the answer before the bell rang and the papers were collected, he would get into a state of excitation, and this frequently led to a pronounced sexual reaction with orgasm and ejaculation, the traces of which were regularly found by the mother on such days." (N. D. Ischlondsky, "Brain Dynamics and Psychic Activity," *J. Nerv. and Ment. Dis.*, 1952, 116, 19-35.)

Jung (*Symbols of Transformation*, pp. 154-155) has drawn attention to the close association between work, music, singing, dancing and rhythms of all kinds among primitive peoples. This connection, he argues, is the bridge to sexuality and provides an opportunity for side-tracking the task in hand.

29. R. E. M. Harding, *The Anatomy of Inspiration*, Cambridge: Heffer, 1942, gives the source of the references to Southey, Galsworthy, Milton, Madame de Staël and Mrs. Hathaway.

30. Rev. C. C. Southey, *Life and Correspondence of Southey*, 6 vols., London: Longmans, Green, 1849-1850, Vol. 2, p. 264.

31. M. V. Marriot, *The Life and Letters of John Galsworthy*, London: Heinemann, p. 588.

32. J. Phillips, "The Life of Mr. John Milton," in *The Early Lives of Milton*, ed. by H. Darbishire, London: Constable, 1932, p. 33.

33. A. Stevens, *Madame de Staël*, London: Murray, 1888, Vol. 2, p. 240.

34. See Harding, *op. cit.*, p. 120.

35. C. P. Obendorf, "Psychopathology of Work," *Bull. Menn. Clinic*, 1951, 15, 77-84.

36. J. Huizinga, *Homo Ludens*, London: Routledge & Kegan Paul, 1949, p. 43.

37. W. N. Evans, "The Cultural Significance of the Changed Attitude to Work in Great Britain," *Bull. Menn. Clinic*, 13, 1949. Other interesting examples of the link between "work" and "sex" are quoted by Jung (*Symbols of Transformation*, pp. 150-151, from R. Meringer, *Wörter und Sachen, Indogermanische Forschungen*, Strasbourg, 16, 1904, pp. 101-196). Meringer points to the Indo-European roots *ueneti*=he ploughs, and *uenos* (Latin, Venus)=enjoyment of love. The Old Icelandic form *vinna*=to work, may be compared with *vinr*=beloved; and the Old High German *winnan*=to toil or drudge with the German *Wonne*=ecstasy.

38. See Elton Mayo, *The Psychology of Pierre Janet*, London: Routledge & Kegan Paul, 1951.

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40. L. Bartemeier, "Eating and Working," *Amer. J. of Orthopsychiatry*, 1950, 20, 634-640.

41. The question whether monkeys are capable of work has been dismissed by Kohts after serious consideration (N. Kohts, "Adaptive Motor Habits of the *Macacus Rhesus* under Experimental Conditions: A contribution to the problem of 'Labour

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Chapter 9

The Psychological Meaning of Illness

SPECTACULAR ADVANCES in preventive and curative medicine during the past century have turned attention from the patient to his disease. But a fundamental feature of any sickness is the patient's personal response to it. This response varies with the nature of the disability from which he suffers and with the meanings and values he consciously attaches to the various limbs and organs of his body.

The ancient belief that sickness is a punishment for wickedness may have arisen partly because the sick person's anxiety may have canalised his feelings of guilt, so repentance was the recipe to allay guilt and dispel anxiety. "In thy sickness be not negligent," we are advised in *Ecclesiasticus*, ". . . put away wrongdoing and order thine hands aright and cleanse thy heart from all manner of sin. . . . He that sinneth before his Maker, let him fall into the hand of the physician." The doctor of antiquity must have had a shrewd understanding of the mentally disrupting effects of illness.

We usually think of our senses, limbs and internal organs as having a physiological function only. But they also express

and make manifest our states of mind and even our social relationships. The anatomist thinks of the hand of a living man in much the same way as he thinks of the hand of a corpse—as a structure consisting of bones, muscles, veins, blood vessels, etc. But his own hands must carry considerably more meaning for him than the hands of a cadaver, as much perhaps as a violinist's hands mean to their owner. In the same way, a footballer places a specially high value on his leg and a woman on hers, which she exhibits as part of her personality.

When we are ill we do not remain, so to speak, healthily separate and detached from our illness. Our sensibilities change. Our self-esteem is reduced; the magical formula "it can't happen to me" no longer holds good. In general, we are apt to behave like children, more self-centred, dependent, insecure, restricted in interests and less self-sufficient. We are liable to tyrannise the people around us.

Apart from changes in sensibility, we undergo other changes during illness which may elude a physical examination, changes, for example, in the images which we have of our bodies. We have an image of ourselves based on our posture, a second image built up by feelings of touch, and a third derived from what we imagine we look like. We also have images of the separate limbs and organs, and in sickness these images may be distorted in one way or another. A false image of the disease may be created. An ulcer may be imagined to be a hole which bleeds. In a woman this image may evoke infantile ideas of the female as a damaged organism, and in a man it may suggest thoughts of femaleness. Again, a woman may think of a malignant growth as associated with pregnancy.¹ When we are vague about the physiological nature of a disability, we are likely to have phantasies which fill in the gaps in our knowledge, and distinctive phantasies tend to be associated with each different medical or surgical disability. The doctor's motives may also be misread. One patient was convinced that the surgeon

had left the instruments inside him, not out of forgetfulness, but to stop internal bleeding.

Superimposed on these general features in our reaction to illness, there are striking differences in individual responses—an endless curiosity about our ailment, a total lack of interest in it, a passivity or compliance, a false gaiety, a depression which canalises previous anxiety or an aggressive resentment against healthy members of the family.

A kind of response which is more common than was formerly believed is the denial of illness or its severity, the formula being "there is nothing wrong with me." Denial of illness was first identified in blind people (Anton's syndrome). The blind person denied that he was blind or acted in a way that showed he did not recognise his affliction; he could not see because of tears in his eyes or because he was not wearing his glasses. The term "anosognosia"² was, however, first used to denote denial of the symptoms of left hemiplegia (paralysis affecting the left side of the body). It has frequently been noted that if a hemiplegic is asked to lift both arms, he lifts one but insists that he has lifted both. His body image is unchanged in spite of the alteration in his body. He seems unaware of the paralysis or refuses to admit that he is paralysed. He will not look at the paralysed limb. He may even deny that his limbs belong to him and declare that they belong to someone else, alive or dead; in this case his body-image has changed, for he disowns part of his own body. It is now recognised that anosognosia is characteristic of brain disease generally.³

Denial is not only expressed explicitly, whether it refers to the complete disability or to part of it. There may be an implicit denial. The brain-damaged patient may lose interest in his disability and manifest changes in his sexual behaviour, suffer from hallucinations and marked fluctuations of mood. He may confabulate or "reduplicate" any aspect of his experience, claiming, for instance, that he has three eyes, several heads and more than one pair of limbs on his right

side. He may even see a solid image of himself. The apparition is dressed like the patient and does what he does. One patient, though he knew full well that the apparition was unreal, felt constrained to offer it a chair when he visited his doctor.⁴

Denial is not a specific disease entity that can be localised in some specific part of the brain. The location of brain damage, whether it is, for example, in the frontal or parietal lobe, determines *what* is denied, not the *fact* of denial itself. Injury to the brain provides only the pattern of altered function in which the patient may deny *anything* that he feels is wrong with him. The *content* of the denial is influenced by states of mind preceding the injury.⁵

Brain injuries, of course, produce psychological damage as a direct consequence or accompaniment of the injury. Although we are not here primarily concerned with this kind of effect, the main types may be briefly mentioned. The direct effects (*aphasias*) are those on the understanding of the spoken or written word. In *alexia* (word-blindness), the victim is able to see the word but cannot understand its meaning, though he *can* understand it if he hears it; the reverse can also occur. In *agraphia*, the patient cannot write the word, in *anarthria* he cannot articulate it, in *agnosia* he cannot grasp the meaning of sensory cues. In cerebral palsy, which is due to brain damage before, during or shortly after birth, there may be a host of psychological handicaps—defects of vision, hearing and the other senses, speech defects, epilepsy, and mental defect, in addition to orthopaedic disabilities, spasticity, athetosis (involuntary movements of unrelated muscles), muscular “overflow,” tremors and rigidity.

In illness other than that due to brain damage, denial may be masked by a plunge into health. The patient convinces himself that if he indulges in vigorous sport or exercise there cannot be anything wrong with him. He puts up a façade to prove that the disability is not of the slightest consequence. Such disguises are common even when there is no “specific” illness: an elderly man, for instance, leaps up a flight of

stairs to demonstrate his youthfulness. Sometimes the patient's relatives welcome the denial and beg the doctor not to disabuse the patient of his delusion. We must evidently look upon such various forms of denial as mechanisms aiding the acceptance of the disability and adjustment to its consequences.

The variety of response shown by different people to similar injuries may be illustrated by the behaviour of a number of very seriously burned patients. Some wept, moaned, bitterly complained and requested help and reassurance. A second group seemed quite unconcerned or appeared to make an effort to avoid thinking about their sad plight. A third group withdrew into themselves and seemed much preoccupied with their own thoughts. A fourth group appeared sad and troubled but friendly. Others were resigned, accepting the disaster without recrimination, as if it were natural. Others, again, suffered from delusions or hallucinations—one woman could see her child in one of her worst burns—denied the reality of the injury or its consequences, or developed symptoms physically unconnected with the burns.

For these reasons we have to distinguish between the anatomical structure of the bodily parts, on the one hand, and their personal and symbolic significance for us, on the other. Of course we do not for a moment overlook the *objectively* real elements in any medical or surgical disability: threat to life, risk of injuring a vital organ or function, danger of losing a limb, economic disruption. But beyond these, there are *subjective* factors which are equally real. Our anxieties about illness are as much due to such subjective factors as to the objective picture given by the physician, and they determine what sort of help we expect from the doctor or nurse. In hospital we look upon them as paternal or maternal figures and often it is their reassurance that we primarily need. We expect them to be ready and able to help at any moment, to know all it is necessary to know about health and illness, and to be devoted, disinterested and indefatigable.⁶

Every form of illness or injury has its characteristic psychological difficulties. A woman undergoing gynaecological examination or treatment suffers intrusion of the privacy of the body; anyone undergoing an operation puts his life in the hands of a stranger; in disabilities affecting the limbs or the skin there are disturbances of the image of the body; and neurological disorders provoke fears of control and of a return to the utter helplessness of infancy.

An operation is not only an interference with our body. We may unconsciously look to it as something that will solve an emotional problem. Widespread folk-lore indeed suggests a belief that the surgical knife influences the mind. We may think of an operation as the lesser of two evils and take advantage of it to avoid something that we fear even more, for example, an impending marriage. Unconsciously it may seem a punishment for guilt feelings; or it may be a partial suicide.

Chest surgery has its special emotional hazards, because men associate the chest with ideas of manliness and vigour and women associate it with womanliness and the maternal function. In both sexes, chest surgery may awaken deep-seated fears of interference with breathing and the dread of death from suffocation. An emergency operation may have the effect of a sudden accident. The event cannot be assimilated quickly enough and the patient reacts with sleeplessness, irritability and anxiety.

A more complex situation is often encountered in plastic surgery because of the patient's motives in seeking the operation in the first place, especially the patient who demands repeated operations. Rhinoplasty, which is a welcome interference with a prominent facial feature, exemplifies the emotional significance of this branch of surgery. The nose protrudes, and it is an external orifice. So it may be unconsciously associated with phallic, vaginal and anal sensations. Nasal deformity may be felt as sexual inadequacy and nose bleeding may apparently occur in place of menstrual flow.⁷

Some ladies who have undergone rhinoplasty do not wish to have children in case the characteristic they have concealed become manifest in the offspring. Others suffer from insomnia because they fear they may injure the nose while they are asleep.

The anaesthesia which precedes the operation affects us differently from the operation itself. When it is necessary to administer an anaesthetic, the patient must be mentally as well as physically ready. Especially is this important for a child, who may be terrified out of his wits if he is held tight to the table and instructed to breathe deeply with the mask clamped down more firmly if he screams.⁸ Undue distress may be provoked by the mere smell of the anaesthetic. The thought of losing consciousness may be linked with infantile fears of separation from the mother and the fear of death. Some of us like to feel we are always in control of what is happening to our bodies and so, if possible, we prefer to remain conscious, though it means more pain. Others cannot bear the sight of blood or anything else of a distressing nature. It is well to remember that the sense of hearing is the last sense to go in anaesthesia.

Let me now turn to the psychological problems of those afflicted with some permanent physical handicap serious enough to constitute an occupational disability. The numbers are considerable. In this country there are some three-quarters of a million persons who are registered as disabled and perhaps a million who are unwilling to be registered as such. Among those registered perhaps a third suffer from disease, injury or amputation of upper or lower limbs.

From a psychological point of view the disabled face a complex task of re-adaptation. Official rehabilitation centres for the disabled are concerned in the main with vocational readjustment and provide training in new occupational skills. The disabled person is, however, confronted with the larger task of fitting himself to a different kind of life as a whole, not only with adjusting himself to a new type of work.

We invest a great deal of narcissism in our limbs. So amputees suffer a great loss of self-esteem. Perhaps that is why many of them are willing to beg for a living. There is a greater feeling of helplessness and more reduction in self-esteem after loss of a leg than after loss of an arm. The disabled, among themselves, distinguish between a disability which is inborn and one which is acquired. Those who are disabled accidentally or in battle tend to regard the others as inferior.

The physically sound tend to avoid contact with the disabled. They have difficulty in empathising with them. The sight of another's disablement seems to make us feel guilty, and we can detect in ourselves a refusal to look at physical deformity or disfigurement. The disabled person may be described by a euphemism; a blind man used to be called "one who sees too well." Many of us still appear to feel that physical distortion is a punishment for evil-doing; the suffering is a means of atonement. Others believe that the disablement is an unjust punishment and so the victim is under pressure to redress the balance by some wicked act, or to avenge himself and "get even" for his sufferings.⁹ Certain disabilities, like epilepsy, have been looked upon as sacred or, like achondroplastic dwarfism, as associated with phenomenal powers. The court jester was originally a dwarf of this kind and granted privileges because of his supposedly supernatural powers. Some, like Origen, have mutilated themselves for the glory of God. In the concern of the public for the welfare of the disabled there is a conflict between rejection and solicitude, and the parent of a crippled child may have mingled feelings of compassion and unconscious hostility.

A deeper understanding of the disabled person is possible when we realise that he feels himself and is often so regarded by the able-bodied, not so much as an isolated individual, but as a member of a disabled minority, a group of like members who are at a distinct disadvantage as compared with the able-bodied majority. A physically sound person seeing a

cripple or someone suffering from a deformity knows nothing of his intrinsic worth as a human being and tends to judge him in terms of his obvious defect, his surface value. He often tacitly assumes that the disabled one is inferior in other respects which are not obvious.

Now members of minority groups generally tend to accept judgments about themselves made by those who have higher status, even if the judgments are adverse.¹⁰ In the eyes of the disabled, the able-bodied have higher prestige, and since the able-bodied tend to look down upon the disabled, the latter tend to accept this devaluation of themselves. The result is that they live, so to speak, on the frontiers of society; they become "marginal men," spectators rather than participators. As compared with the able-bodied, they are exposed to many more frustrating experiences, partly because of their greater dependence on others, and so they suffer greater insecurity.

Not all restraints on the disabled are imposed by other people. Some are the inevitable results of the disability. A legless man will not expect to play football. So a distinction must be drawn between non-participation in various activities and non-acceptance by those sound in body. The disabled realise their handicap and appreciate reasons for non-participation. But non-acceptance because of the unsightliness of the defect or because its incapacitating effects are exaggerated, seems to them an injustice.

As far as possible, the life of a disabled person should therefore be such as to minimise chances of being judged superficially and to maximise the opportunities of being known. This is more likely to happen in a small town where people are not exposed to the countless surface contacts unavoidable in a large city.

Finally, a few words might be added about wider practical implications. In all illness the questions must be faced: how much we, the patients, should be told, and when? In England, there is a tradition of telling nothing at all, a tradition of priestly, esoteric secrecy. As patients, we feel that it is an

impertinence to ask for any details about our illness. Imagine the horror-stricken expression on the face of a doctor asked by a patient to explain what is wrong with him. There is, of course, a danger of telling the patient too much as well as of telling too little or nothing at all. In whatever he tells us, the good doctor will distinguish his own anxieties about the technical aspects of treatment from the patient's own anxieties. He will ask himself: what is the patient trying to convey or conceal? What do his symptoms mean to the patient?

Although some of us do not want to know the truth about ourselves during illness and may even regard a diagnosis as a death sentence, the doctor will try to make the boundaries between our health and sickness clearly defined, not vague and blurred, and he will therefore avoid equivocal statements about our state of health, and he will not encourage us to imagine the worst.

Any change that is likely to take place in our appearance as a result of treatment will be carefully explained beforehand and convincing reasons for the necessity of the change will be given. No one will be left in any doubt about an impending amputation and no attempt will be made to reduce the significance of the loss. Excessive optimism or pessimism about our future health will be avoided. And no operation, such as bilateral frontal leucotomy for intractable pain, will be undertaken which transforms the patient into an apathetic mental defective, so long as less desperate surgical or other measures are possible.¹¹

Although it would be misguided and foolhardy to raise the hopes of those suffering from cancerous growths that the intervention of psychiatry in the present state of knowledge might be helpful, it is not impossible that future research may reveal a psychic component in the etiology of certain forms of cancer which has been hitherto overlooked. Some indications that this view is not entirely fantastic appear in a review of recent attempts to explore the emotional life of

different groups of cancer patients. The prolonged survival of some patients beyond medical expectation, the "spontaneous" disappearance of advanced disease in others, as well as the very great variations in rates of tumour growth, have puzzled many authorities and have opened the way for a broader approach to the study of this scourge.¹²

All those who are professionally or otherwise concerned should realise that adequate psychological preparation before a period of surgical or medical treatment in hospital can do much to prevent subsequent anxieties and to facilitate recovery; this is particularly important for child patients. A study of children aged 2 to 9 years, who had been operated upon showed that many of those who had not been psychologically prepared in advance revealed disturbances in behaviour from which the children who had been prepared were free. Those who were untroubled afterwards had been told the reason for the operation and even how it would be done. They had been brought by a parent, given a sedative in the bedroom, and greeted by a parent after the operation. They had not been tricked into the hospital by being told that they were on the way to a cinema, nor had they struggled against an anaesthetic or seen terrifying-looking instruments.¹³ Similar measures could be taken to prevent children's fears of dental treatment. A child could come and sit in the dentist's chair in order to get familiar with the drills and other equipment.¹⁴ Experience shows that such measures reduce a child's resistance to dental treatment. Probably fear of pain deters many adults as well as children from visiting doctor or dentist, and eventually when they have to go, a great deal of avoidable damage has already been done.

In this chapter I have said nothing about mental disease proper. This is deliberate. I feel that clinical psychology should not be confined to mental hospitals or to the administration of tests. Like psychiatry, it has a legitimate sphere in the study of "physical" disease.

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Chapter 10

Psychology in Relation to Literature*

"IF YOU RENDER Voltaire less sensitive to criticism," said Diderot, "he will no longer be able to penetrate the soul of *Mérope*."¹ This sentence sums up a volume which might be written on the way a writer's temperament affects his understanding of the characters he creates or subjects to critical analysis. Like many another novelist or poet, Balzac foreshadowed a great deal that was to be written by the psychologist on unconscious mental activity. He was most explicit perhaps when he declared, fifty years before Freud, that "some devotees of the more remote sciences may discover that the intellectual organisation is but a kind of internal man who works out schemes and makes plans no less than the external man, and that the struggle between these two (invisible to our frail sight) is no less mortal than the war with the fate to which we subject our weak bodies."

These examples show that an intuitive mind may discover a whole realm of psychological theory later to be mapped out in detail by the patient investigator. On the other hand, in a

* The italics in the quotations cited in this chapter are mostly my own.

variety of ways, a psychological approach has opened new avenues to the study of literature. Analysis of the content of the imagery of different poets showed, for example, that Shelley preferred to use images of smell, Keats images of taste and touch, Blake images of organic sensation, Swinburne images of movement, and Edgar Allen Poe and Schiller auditory images. Both Shakespeare and Goethe are rich in all forms of imagery, especially visual.²

There have also been studies of some certain elements which enter into the appreciation of literature, for instance, how metaphors are understood by children of different ages. The results are sometimes rather striking. A boy of thirteen explained that Shakespeare's line "A tiger's heart wrapp'd in a woman's hide" meant that "women are harmless if left alone." Another boy understood "All the world's a stage" to mean that "it has daily turns." Schiller's line "hunger makes the world go round" was interpreted as meaning "if you are hungry you feel dizzy," and the saying "there is poison in standing water" was said to mean "always drink from a tap."

A new orientation to literary criticism was made possible by Freudian theory. This was directed towards an understanding of the nature of creative writing, the choice of themes, the elaboration and resolution of plots, and, in particular, to the far-reaching influence of experiences in the author's infancy and childhood on his mature work.

Freud³ took the view that the writer is rather like a child at play. He creates a world of fantasy which he himself takes very seriously. He disguises it so that its self-centredness is not apparent, and hence enables the reader to enjoy his own fantasy without guilt, reproach or shame. The writer thus enlists the reader almost as an accomplice in releasing impulses which would otherwise find no outlet.

Freud further suggested that the recurrent themes of great novels and drama are often the expression of fundamental human conflict which is reflected unconsciously in the author's mind. The Oedipus theme of Sophocles is perhaps the most

celebrated example. The manner in which this idea is applied to literary criticism is illustrated by Ernest Jones's penetrating analysis of *Hamlet*. The difficulty in understanding Hamlet's hesitancy has baffled countless critics. Ernest Jones argued that it can be resolved if we assume that Hamlet was unconsciously motivated by the same wish that led his uncle to kill his brother and marry Hamlet's mother.

Here, too, I should mention the mechanisms of projection and introjection which enable us to understand how identification with the characters in a story or play takes place by the author, on the one hand, and by the reader or theatre audience on the other. Flaubert's remark: "Madame Bovary, c'est moi" is perhaps typical of what an author could say with reference to any of his characters.

A different branch of psychological theory suggests parallels with the representation of the human personality in literature. I refer to topological psychology which owes its origin to the late Kurt Lewin.⁴ In contrast to psychoanalysis which examines the life-history of a person or the social history of a group, topological psychology analyses the life-space of the individual or group. Both systems, however, regard the mind as consisting of a number of interrelated functional systems which become more and more sharply divided with increasing age. Both lend themselves to spatial representation.

The novelist, poet and dramatist are believed to be gifted with special insight into human life. They express this insight not in general concepts or in the form of hypotheses which can be put to the test, but in terms of individual persons. Now a mode of representing personality which could conceptualise the novelist's individual descriptions would have two distinct advantages. It would preserve the "person as a whole" without fragmentation and, second, little would be lost in passing from descriptions of individuals to descriptions of general characteristics in terms of which any single person might be described. Topological psychology claims to have these advantages. Its analysis is at once specific, for it relates to a

particular person or group, and at the same time it is expressed in *general* terms. It exposes a "horizontal" section of personality at a given point of time, just as Freudian analysis exposes a "vertical" section by following a particular sequence of events over a period of years. It studies the factors operating *now*, not those in the past which led to or produced the *now*.

The point I wish to bring home is this: it seems that the kind of representation of the human personality made by topological psychology—in terms of *regions*, *paths*, *movement*, *barriers*, *boundaries* and *tensions*—is one that comes naturally to many writers, and not only to writers of fiction. If so, the spontaneous insight and imagery of the writer would be in accord with the theoretical schemes of the psychologist. And we could assume that the psychologist's manner of conceiving and representing the personality is supported by the intuitive representations made by novelists, dramatists and other creative writers.

Let me now give some instances from literature of representing human experience in topological imagery.

I begin with a quotation from Sherwood Anderson's short story *Seeds*.⁵

"There is a note that comes into the human voice by which you may know real weariness. It comes when one has been trying with all his heart and soul to think his way along some difficult road of thought. *Of a sudden he finds himself unable to go on. Something within him stops. A tiny explosion takes place.* He bursts into words and talks, perhaps foolishly. Little side currents of his nature he didn't know were there run out and get themselves expressed. It is at such times that a man boasts, uses big words and makes a fool of himself in general."

In this passage a difficult intellectual task is represented as a form of movement within a region. This movement continues until the boundary of the region is reached. Tension is then

aroused, and the result is that a transformation takes place in neighbouring regions of the personality.

The same effect is produced by Mauriac in the following passage from his story "The End of the Night" in *Thérèse*.⁶

"Yet it was borne in on her with complete certainty that *she had reached some sort of limit*—as when a tramp realises that *the path he is on leads nowhere* and loses itself in the sand."

We recollect that Dante begins the *Inferno* with a metaphor of this kind:

"In the middle of the journey of our life I came to myself in a dark wood where the straight way was lost. Ah! how hard a thing it is to tell what a wild, and rough, and stubborn wood this was . . ."

Stefan Zweig,⁷ in his life of Romain Rolland, employs similar imagery: "He (Rolland) *halted on a road which he had recognised to be impassable*, but he did not forget his aim 'to defend greatness on earth.'"

I have come across two very similar examples of a very striking analogy between emotional experience, on the one hand, and physical movement and constraint, on the other. One is from Flaubert's *Sentimental Education*⁸ and the other again from Mauriac's *Thérèse*. Flaubert wrote:

"*He kept moving restlessly within the confines of his passion just as a prisoner keeps moving about in his dungeon.*"

Here passion is represented as a region with definite boundaries which cannot be crossed. Psychologically, from the point of view of restricted mobility, a man in the grip of a passion closely resembles a prisoner in a cell. In the one case, the zone of free movement and its boundaries are emotional; in the other case, they are made of bricks and mortar.

There is another point of particular psychological interest in relation to Flaubert that I ought to mention at this point. The conception of a *life-space* for each individual implies that each person has his own characteristic and distinctive way of perceiving his surroundings, though physically and geographically they are the same surroundings of other people. Now, Maupassant attributes a remark to Flaubert that embodies this very idea. Flaubert said, "There is no truth except . . . in the fashion that we perceive the objects." This is a different way of saying that the manner in which the external world is perceived by us is determined by the structure of our individual minds. Maupassant added:

"To Gustave Flaubert, a fact in itself signified nothing . . . instead of displaying the psychology of his personages in explanatory dissertations, he simply made it appear by their acts. The inward was thus unveiled by the outward, and without any psychological argument."

The second example of a spatial representation of a passion, found in Mauriac's *Thérèse*⁹ is this:

"She was about to enter a prison worse than the narrowest of graves, the prison built around her by her act."

Here, too, a state of emotion is represented by an enclosed region, a prison in fact.

Much the same kind of spatial representation is used on one occasion at least by Mr. T. S. Eliot¹⁰ in his *The Use of Criticism*, where he remarked:

"In the writing of poetry often something negative happens, that is, the breaking down of strong habitual barriers—which tend to re-form very quickly. Some obstruction is momentarily whisked away. The accompanying feeling is less like what we know as positive pleasure, than a sudden relief from an intolerable burden."

A vivid illustration of topological thinking is found in a passage which Balzac¹¹ puts into the mouth of his scientist Planchette, in *The Wild Ass's Skin*.

"Movement, locomotion, changing of place? . . . Everything is movement, thought itself is a movement, upon movement nature is based. . . . We feel its effects without seeing it. . . . It surrounds us, intrudes upon us, and yet escapes us. . . . It is evident as a fact, obscure as an abstraction; it is at once effect and cause."

The conception of a task or activity or even of living itself is often represented as a path in other cultures besides our own. Ortega y Gasset tells us that "there arises at the beginning of all cultures a term expressing "*road*" in this sense; the *hodos* and *methodos* of the Greeks, the *tao* and *te* of the Chinese, the path and vehicle of India."¹² He himself conceived of life in this way when he wrote¹³ that man "labours to find '*roads*,' '*ways*' through the woods in the form of clear, firm ideas concerning the universe, positive convictions about the nature of things," and that "whoever aspires to understand man—that eternal tramp, a thing essentially *on the road*—must throw overboard all immobile concepts and learn to think in ever-shifting terms."¹⁴ In mythology and religion, as Cassirer¹⁵ has abundantly shown, transition from one sphere to another involves *rites of passage*. These rites govern not only geographical moves, as from one city to another, but also moves from one phase of life to another, "childhood to puberty, celibacy to marriage, childlessness to motherhood, etc." Like Balzac, the process of thinking seemed to Gasset as movement. "Like any *movement*," he wrote, "thinking is the release of a potentiality," and he added, "*Indeed, thinking is not only a movement; it is the end towards which the movement tends.*"¹⁶

When I read this passage I was strongly reminded of the drawings of a schizophrenic woman in a mental hospital. Her drawings consisted of heads of people, and in each case, from a centre in the forehead many lines radiated in all directions.

When I asked her to tell me the significance of these lines, she replied that they were the person's thoughts.

It is of particular interest to find that such a distinguished neurophysiologist as Professor E. D. Adrian¹⁷ finds it helpful to employ topological imagery in representing the problem of correlating mind with brain.

"The physiologist," he said, "must go forward so far as he can. . . . *He has still far to go along this materialistic pathway*, but the impression which should be left is not one of failure. It will be no failure *if we come to a region* where our present models of physical reality will need some radical addition if they are to content us; and although *this region may be a long way off* . . ."

This all too brief sketch has tried to convey the suggestion that the creative writer's intuitions about the structure of personality and the patterns of experience are paralleled and given a systematic form in the theoretical representations of topological psychology.* Marcel Proust was the great artist of the life-history. Topological psychology may one day inspire another creative mind to express in the language of space what Proust achieved in the language of time.

* A remarkable example of the topological conception of mind which has come to my attention occurs in Shelley's recently discovered notebooks, particularly Shelley's drawing of a mental labyrinth. (See Neville Rogers' *Shelley at Work*, London: Oxford University Press, 1956.)

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